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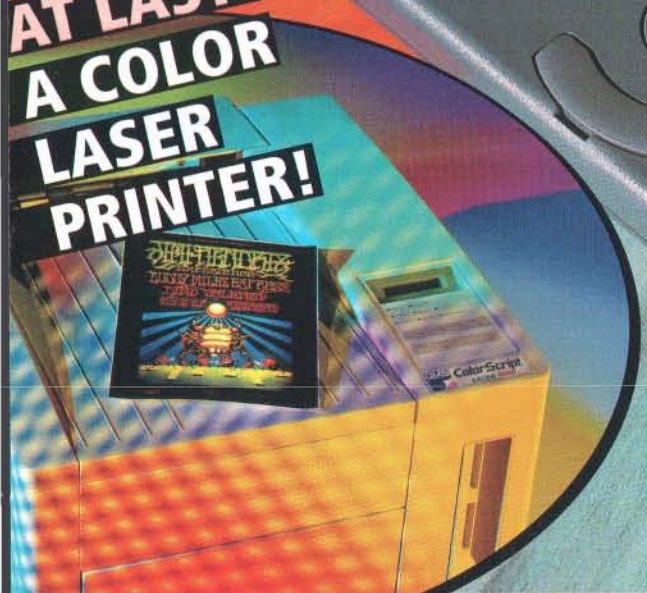

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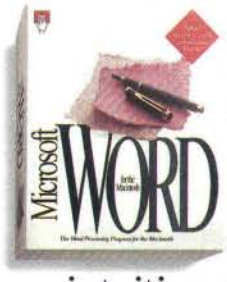

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The QMS ColorScript Laser 1000 is the first color laser printer ever.

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Make your Mac turn your wishes into its commands.

On the cover: The new PowerBook 180c features a color active-matrix screen.
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MacUser

August 1993 **Volume 9 Number 8**

Cover Story

Fast and Active: The PowerBook 180c

By Russell Ito

MacUser LABS If you have been waiting for a color PowerBook that can match the best that the DOS and Windows worlds have to offer, your wait is over. The PowerBook 180c combines a vibrant active-matrix color display with top-of-the-line performance. **43**

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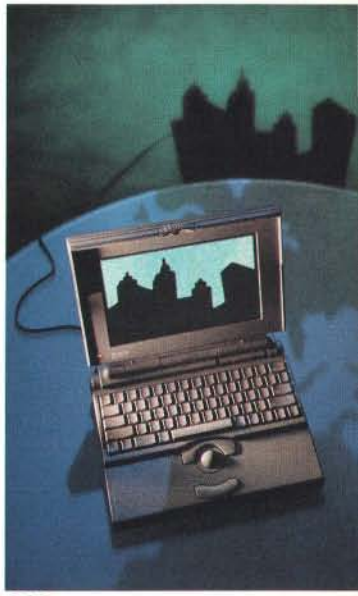

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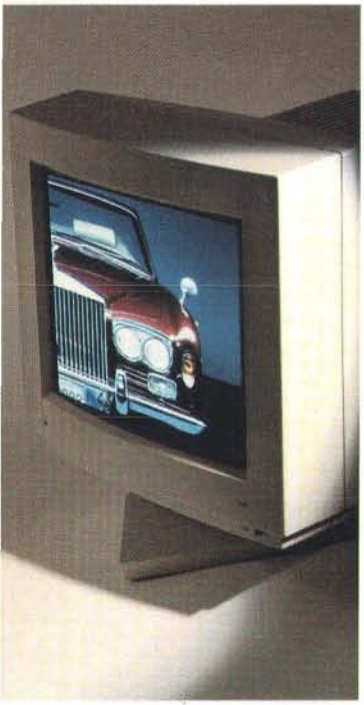

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CA-Cricket Draw III 2.0 The latest release of this affordable illustration program makes a bid for the high end by adding new professional-level tools, including tweening, editable type outlines, and support for color separations. **56**

Apple Color Printer and **Apple Color OneScanner** This color-publishing combo adds up to an affordable but lackluster color system most suitable for general office use. **60**

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MapInfo 2.0 MapInfo takes a clear lead in sheer mapping power by combining a database manager with graphical mapping features and a special programming environment. ... **65**

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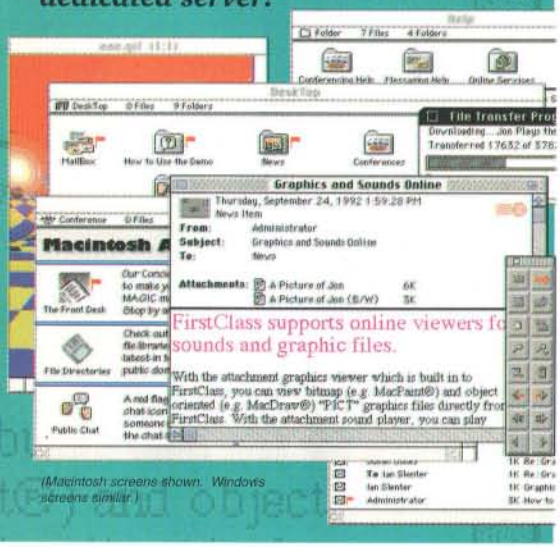

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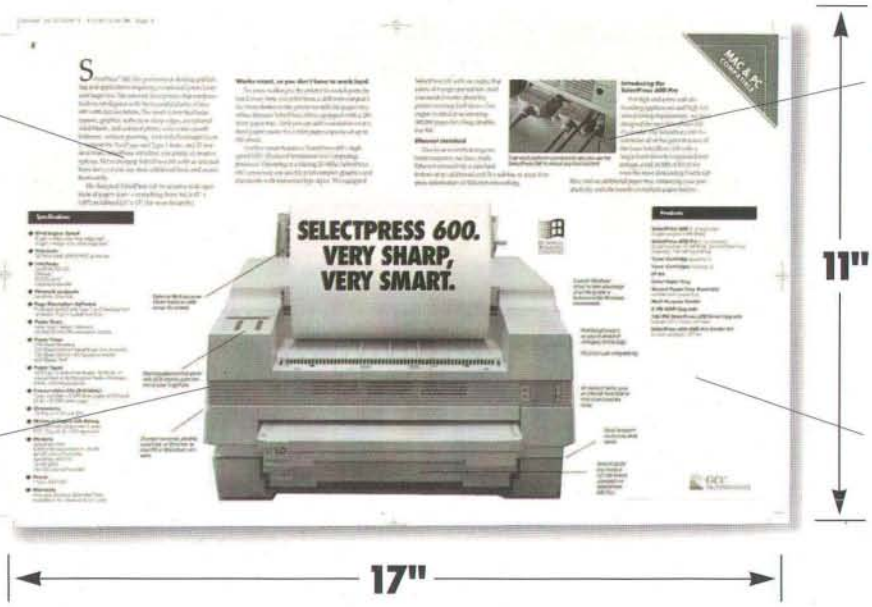

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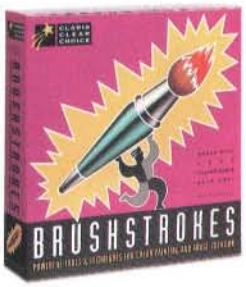

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About **MacUser**

Magic Touch

When *MacUser* needed someone to evaluate the current crop of QuickTime special-effects software, longtime contributing editor David Biedny was the only possible choice. Biedny is intimately familiar with the real illusion: He worked for George Lucas' Industrial Light and Magic, where he used Macs and Silicon Graphics machines to help create digital special effects for such movie blockbusters as *Terminator 2, The Rocketeer,* and *Hook.* In his story this month, "Movie Magic" (see page 92), Biedny tests two promising new special-effects packages for the Mac to see whether they can deliver the (imaginary) goods.

Multimedia and QuickTime are no recent infatuation for Biedny, who started out with a 128K Mac and one year later, in 1985, collaborated with performance artist Laurie Anderson on one of the very first avant-garde Mac-based videos, using ThunderScan and a beta version of VideoWorks (now MacroMind Director) for animation effects.

Contributing editor David Biedny has never met Godzilla, but he knows how to make monsters with Macs.

Throwing caution to the wind, Biedny started one of the first multimedia companies, long before the tools existed, creating productions for companies such as General Motors, American Express, and AT&T.

"We used absolutely whatever we could — HyperCard, Director, Photoshop — and hacked the hell out of it. Our goal was to produce technologically sophisticated projects with slick production values."

So slick, in fact, that when John Sculley saw a version of an interactive touch-screen piece that printed stickers, he could not believe it had been done in HyperCard.

"We had to prove it to him," recalls Biedny.

It was at ILM that Biedny learned that you live and die on the edge. "In digital special-effects work, the goal is to make the edge [the blue halo effect that mars the appearance of a shot] go away. If you've done that, you've done a good job."

Biedny was glad when Apple released QuickTime.

"QuickTime has given us a way to play around with video without having to invest $100,000 in editing equipment. It's slow, but all the capabilities are there.

"And when the next generation of high-end Macs comes out, there won't be a distinction. All you'll need is QuickTime, Premiere, and After Effects, and you'll have all the tools of a professional videographer."

All digital, of course. Biedny predicts that the end of the decade will mark the death of analog video.

Maybe. But whatever the future of video, it's clear that Biedny will continue to live on the edge.

— *Nancy Groth*

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CIRCLE 143 ON READER SERVICE CARD.

Read my

THE BOTTOM LINE

The HP ScanJet IIc sets a new standard for affordable color scanners. Its engine is fast and well-engineered, and HP's innovative color-callibration software makes hassle-free, "true"-color scans a reality. Prices at less than $2,000, the HP ScanJet IIc is a best buy in its class.

It's blazingly

The HP ScanJet IIc ***uses a one-pass scanning method that makes it one of the fastest color scanners we've seen.*** It also provides time-saving color previews that dynamically display any changes you make to the scan, such as exposure, hue, and saturation modification.

HP combines its excellent color-calibration technology with one of the best scanning engines we've seen. Our tests for resolution, consistent tracking of the scan head, and color accuracy showed **the HP ScanJet IIc to be a top performer.** In addition

TOP-NOTCH HARDWARE TEAMED WITH INNOVATIVE SOFTWARE MAKES HP'S NEW COLOR SCANNER A WINNER.

WINNER

MacWEEK 1992 DIAMOND AWARD

1992 Diamond Awards

For an all-around scanner offering high-quality color and black-and-white images, true 400-dpi resolution, and good basic scanning software, **HP's ScanJet IIc can't be beat.**

Hewlett-Packard's ScanJet IIp sets a new standard for affordable desktop gray-scale scanners. From

Top honors in every s

"We were extremely impre

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clips.

fast!

and black-and ... the **ScanJet IIp is an exceptional product.** The scanner is just 16 ... by ... by

WINNING COMBINATION

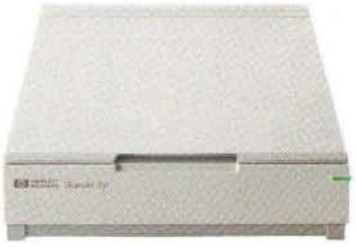
To test the HP ScanJet IIc, we used the same set of tests we used for our most recent color-scanner lab report. The results showed **HP's new scanner to be the best in its class in both hardware and software. The ScanJet impresses from the moment you open the box.** Other scanners use a removable screw that locks the scan head for shipping, but HP uses a locking lever that's built into the scanner itself. There's no screw to lose, and the lever is so easy to use that you'll find yourself locking the scan head more often, thereby increasing its life span.

ner category.

ed..."

MACWORLD 1992 World Class Award Winner

HP ScanJet IIc



HP ScanJet IIp

We'd hate to brag. So we'll let the Mac press do it for us.

Macworld awarded both the HP ScanJet IIc and IIp their *World Class Award*, and named the HP ScanJet IIc as the *Best Color Scanner* for 1992, and the HP ScanJet IIp as the *Best Black & White/Gray-Scale Scanner*. While *MacWeek* gave their prestigious *Diamond Award* to the HP ScanJet IIc.

Speed. Simplicity. And accuracy were all applauded. It's no wonder. HP's single-pass scanning delivers both lightning-fast speed and precise color registration. TWAIN support allows scanning without having to switch between applications. And HP AccuPage technology with 400-dpi resolution can tackle the toughest OCR challenges. What's more, capabilities this advanced have never been this affordable. List price on the HP ScanJet IIc is just $1,599. The HP ScanJet IIp is just $879. And right now, the HP ScanJet IIc includes Adobe™ Photoshop LE.

Impressed? Don't just take our word for it, or even the Mac press's. Attend one of our scanning seminars that will be held April through September, 1993. To find out more about the HP ScanJet IIc and IIp or seminars in your area, call 1-800-SCANJET, Ext. 7364.* And judge for yourself.

HEWLETT PACKARD

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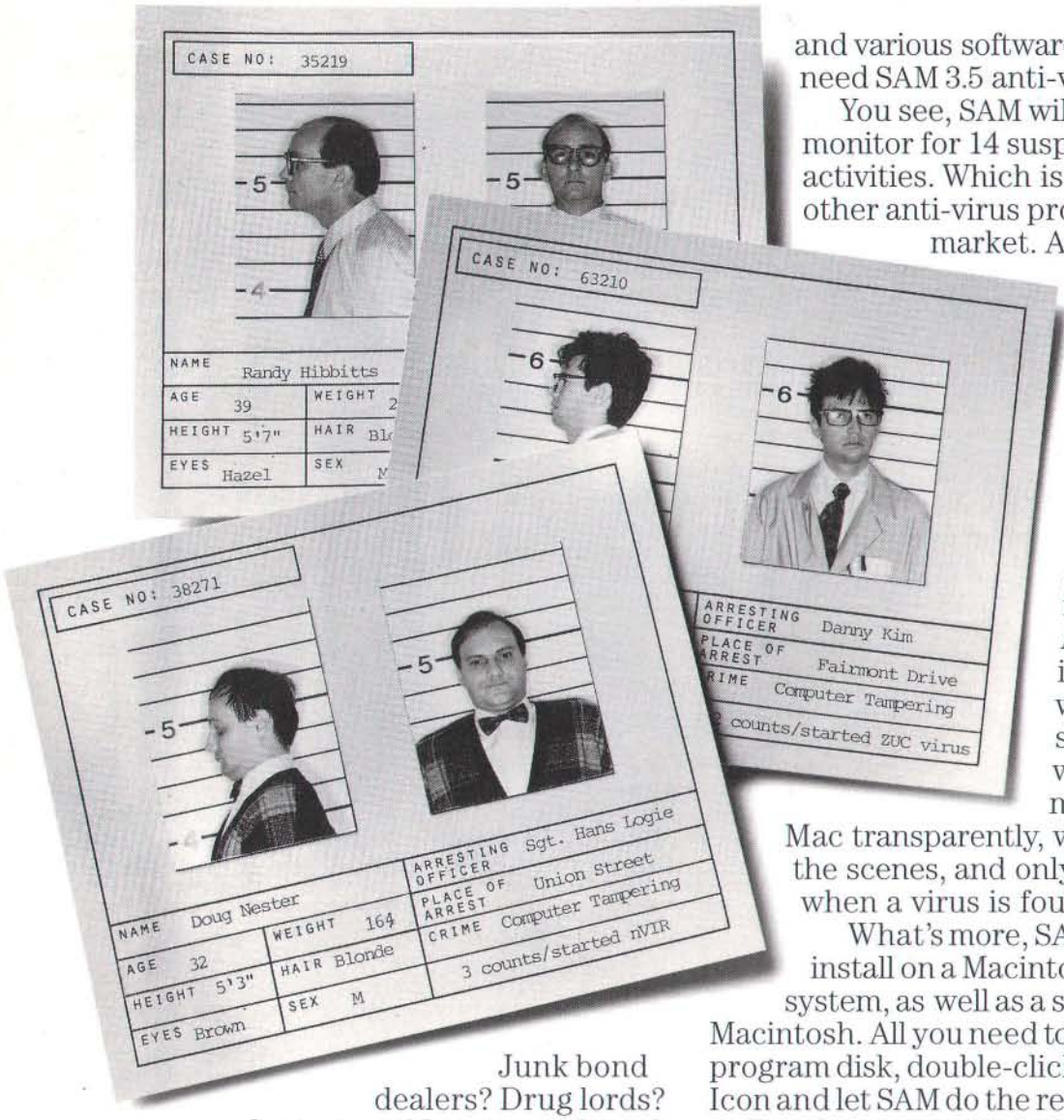

Junk bond dealers? Drug lords? Savings and Loan presidents?

Nope, they're computer hackers. And judging by their physical appearance, you wouldn't think you'd need any protection from them. But you do. Or rather, your computer does.

And to keep these criminally minded people from infecting your files, floppies and various software programs, you need SAM 3.5 anti-virus software.

You see, SAM will constantly monitor for 14 suspicious viral activities. Which is more than any other anti-virus program on the market. And it's the only program that will scan compressed files in System 6 and 7.

So basically, if your Mac has a virus, SAM will detect it, get rid of it and repair the file. And if your Mac is virus-free, SAM will help to make sure it stays that way. Because it monitors your Mac transparently, working behind the scenes, and only interrupting when a virus is found.

What's more, SAM is simple to install on a Macintosh networking* system, as well as a single-user Macintosh. All you need to do is load the program disk, double-click on the Installer Icon and let SAM do the rest.

For the most anti-viral protection, pick up SAM 3.5 at your local retailer. It's the most popular anti-virus program in the world, and will keep you from ever having to deal with this ugly crime. Or these ugly criminals.

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LETTERS

"What do you call people who produce specialized output on personal computers from database programs, word processors, minor DTP applications, etc.?" inquires Wally Holmberg, of Dallas. After saying ixnay to "Computer Operators," Wally offers the title Data and Document Producers, which is, coincidentally, how he signed his letter. Sorry, Wally, but DDP sounds too much like a pesticide, unless those people are weeding out excess verbiage. *They're* editors.

Write to Letters to the Editor, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404, or post your letter on the MacUser Forum of ZiffNet/Mac, our on-line service. All letters become the property of *MacUser*, and we reserve the right to edit any letters we print. Please include a return address and a daytime phone number.

If Macs Grew on Trees

I love *MacUser!* But I am sick and tired of turning every page to be confronted by Mac after Mac after Mac. Where do all these machines come from? If I were simply a tourist on earth, flipping through *MacUser* would convince me that Macs grew on trees. It makes me grumpy. I just picture some big room up there with hundreds of fully functional Macs and peripherals, just waiting to see the fluorescent light again and maybe even have their picture taken.

This brings me to a question that has been building in my brain ever since your photo of a bowl-o-SIMMs a year and a half ago: Can I have one? Just one? My quest for this country's expensive knowledge process has left me Macless. I want to *be* a Mac user!

Michael Price
Minneapolis, MN

Another SE Saved!

Thank you for providing informative articles that help us find affordable alternatives to buying every new machine Apple introduces. After reading your article "Supercharging Your Mac: 100 Accelerated Systems" (April '93, page 118), I ordered a Mac SE upgrade from MicroMac Technology — the only company that would convert my trusty SE into a modular computer arrangement. This upgrade meets my current needs perfectly, and I can hold on to the few thousand dollars it would have cost to purchase a fancier computer.

Cindy Pickering
Fishers, IN

Peace, Love, Scanners

I have just read the scanner shoot-out in the May issue of *MacUser* ("Getting the Picture: Color Flatbed Scanners," page 106), and I'm so angry that I can barely type. I read hardware reviews to find out one thing and one thing only: which piece of hardware works the best. I do not care if the packaging is wasteful, and I do not want nontechnical, California mumbo-jumbo nonsense like that to be part of the rating system for any product. For a product such as a scanner, I do not care if technical support is good, because (unless the scanner arrives broken) no one who uses a scanner will need extensive technical support. I would like to know why you feel you have to accommodate some sort of West Coast, one-world, squishy, touchy-feely, politically correct editorial bias?

Geoff Latta
via ZiffNet/Mac

Squishy? If a manufacturer packages its hardware in the equivalent of tissue paper, scanners arrive broken. When scanners arrive broken, technical support is needed. And if companies take weeks to answer inquiries, wouldn't

Open Folder

Our readers north of the border continue to ply us with interesting mail. Samir Younan, of Mississauga, Ontario, Canada, wants to know if the coupon for free Apple system software referred to in Jon Zilber's April column ("Letter Rip," page 25) was removed from magazines sold in Canada. "Is this offer only available for Mac owners in the United States?" To paraphrase Wayne and Garth: Apple offer free upgrades? Yeah, and pretty soon monkeys will fly out of my floppy drive. Sorry, Samir. It was an April Fool's joke.

Although he saw through Jon's ruse, Michael Luther, of New York, didn't think it was very funny, especially the bit about $500 toward the purchase of third-party software. "Does Apple think that we Mac users are so flush with cash we can afford to finance their sorties into expanding their customer base? Does anyone in Cupertino know who's on first? Feel the urge to be the first on your block to get the latest in Mac hardware? Take a cold shower, and save your money."

But just when you think you have it all figured out, something like this happens: David J. Lansing, of Latham, New York, was cranky when it took five months for his IIvx to arrive. Business as usual, right? "My attitude changed as soon as I unpacked my IIvx and found a small note from Apple saying that it had installed 8 megabytes of RAM instead of 5 megabytes for its 'convenience in manufacturing.'" Apple *gave* you 3 megabytes of RAM? Is this its way of apologizing for the Centris line?

It only goes to show that you have to get up pretty early in the morning to fool vendors these days. Case in point: Bob Schmidt, of Omaha, Nebraska, reports that his department is pleased with its new Hewlett-Packard LaserJet 4M printer and the extra mile HP has gone to ensure customer satisfaction. How's this for a warranty? "Your Optional 500-Sheet Paper Tray Assembly is covered under your printer's one-year warranty or 90 days, whichever is longer." Adds Bob, "We decided to opt for the one-year plan." Smart move.

Got something on your mind? Here's a chance to get it off your chest. Send your bouquets and brickbats to Open Folder, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404. All the usual caveats about letters apply.

ILLUSTRATION: JOHN CORBITT

The new 3.5" removable

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The Infinity Turbo 105 S sets a new standard in Winchester, removable storage. It is the smallest, yet fastest removable drive around, allowing you unlimited storage capabilities by simply adding additional 105MB cartridges.

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In short, the Infinity Turbo 105 S offers a realistic storage solution for storing multi-media, desktop publishing and database files. And for dependability you can trust, the Infinity Turbo 105 S utilizes time-proven Winchester technology - the same reliable technology used by your fixed hard drives.

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PLI

you want to know that before you purchase their products? As for awareness of packaging that's environmentally sound — get with it, daddy-o, it's the '90s. — PP

What's the MO?

I would like to raise some issues about your recent review of optical storage products ("3.5-Inch Magneto-Optical Drives," April '93, page 162). I have closely reviewed the test scripts and drive software of many of the products you reviewed. MicroNet Utility offers the setting Write and Verify as the default. Only one other vendor offered this option in its software, but not as the default setting. Because verified writes were not addressed in this review, I believe that the product ranking could be misleading to your readers and unfair to the MicroNet product. When MicroNet Utility is set to use the standard Write command (as most of the other products do by default) instead of the verified write, the speed of our unit is as fast or faster than that of the quickest Sony-based mechanism you reviewed.

William A. Long
MicroNet Technology, Inc.
Irvine, CA

Write and Verify is more time-consuming than the standard write procedure. MicroNet's driver does verify writes by default, unlike the other software we tested. We agree with MicroNet that, for safety's sake, write verification should be on by default, with the option of turning it off left to the user. — MF

Just how fast is 100 percent of a DGR 128REM anyway?

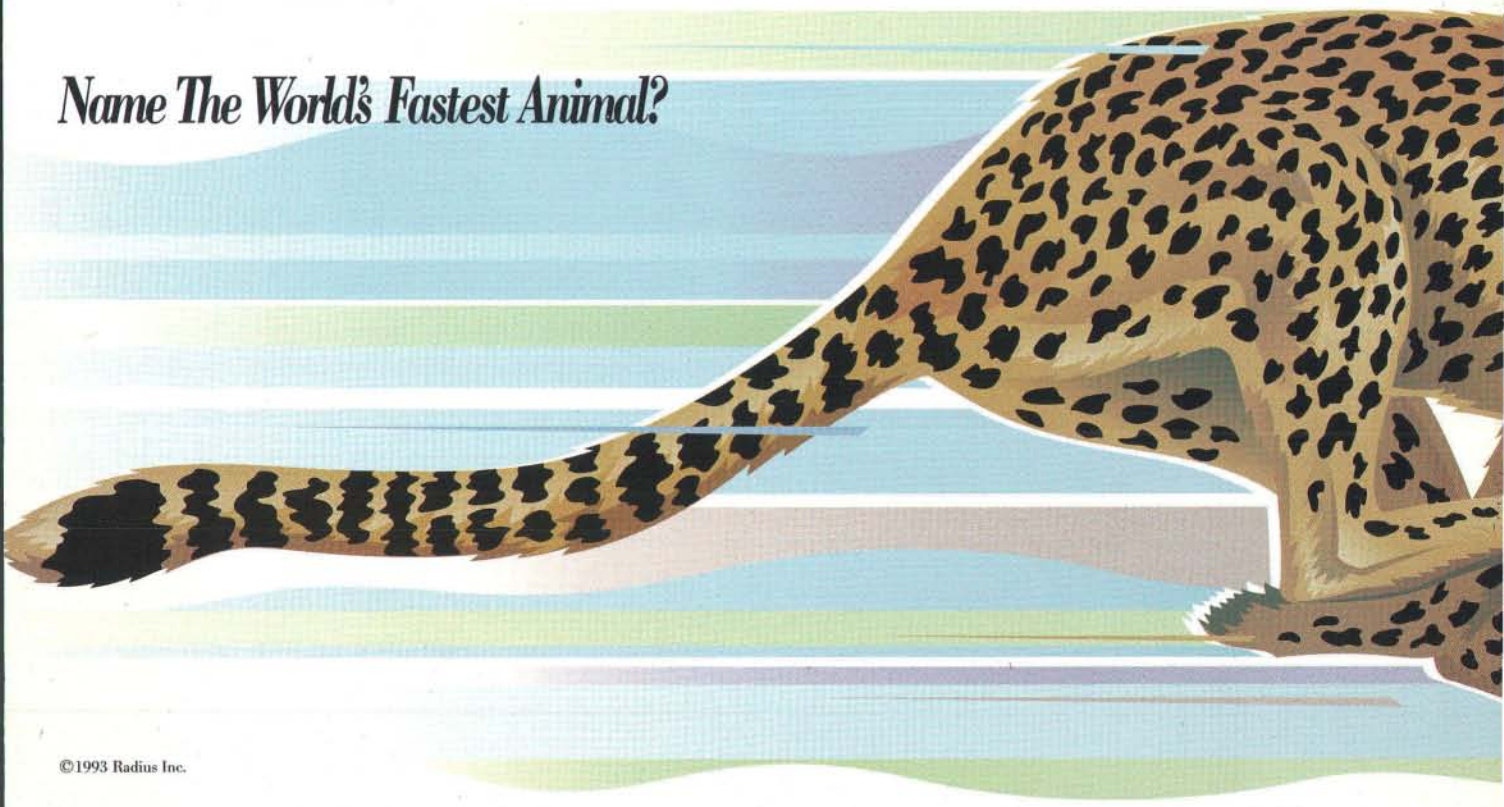
Speed = 100% IIci(SE – IIfx) + 25

Stop using relative performance measurements! Use absolute performance measurements. I am tired of seeing "15 percent faster than a IIci" or "100 percent faster than a Quadra 700." You give no data for comparing hard-drive performance. For instance, in your April article on 3.5-inch magneto-optical drives, there were no absolute references such as read/write megabytes per second (burst and sustained throughput). Just how fast is 100 percent of a DGR 128REM anyway? If you must continue using relative measurements, please at least annotate the scales with absolute values overlaid so as to provide readers with much more useful indications of performance.

Steven F. Sutherland
North Charleston, SC

He Likes Helix

In Don Crabb's recent review of Helix Express (April '93, page 79), Crabb excluded Helix Express from his list of "top-of-the-line relational-database programs" and repeated the common wisdom that the "overall performance remains sluggish." We at Antley Business Systems disagree. Our company has built



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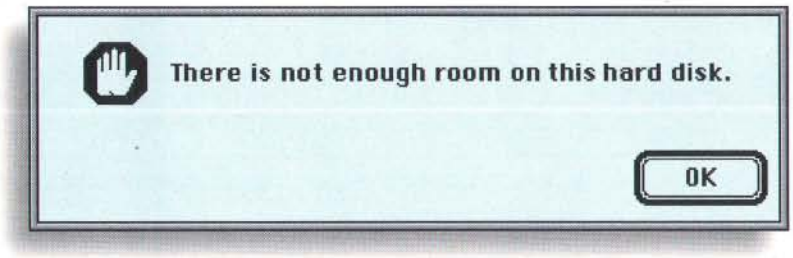
Instead Of Getting This Box,



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Easy, One-Time Installation. Have you ever said "If I run out of disk space one more time I'll scream?" Well, don't say that any more. And stop screaming.

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At just $149, nothing is this affordable, simple or practical. And, it beats screaming.

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CIRCLE 111 ON READER SERVICE CARD.

its reputation on designing multiuser databases for Mac networks. Well-designed multiuser Helix collections are actually fast. In every instance where the system appeared to be slow, I have found that the problem lay not with Helix but with the design of the database. Helix is not only an easy-to-use development tool but it is also a fast and powerful database engine and server. We have yet to find any complex, 4D multiuser system that can begin to keep up with our Helix collections.

If you base your evaluations of Helix on collections built with Helix, then say so. Please do not continue to give the impression that you are evaluating the speed of a development tool as an engine when you are actually evaluating the speed of a collection built with that tool.

Bob R. Antley
Minneapolis, MN

We agree that database performance is based on several criteria: hardware speed (including the network in use), speed of the database software, and the design of the database application itself. However, you are wrong to say that I did not consider the design issue in my review. You also incorrectly assume that because your business is designing databases, your experience with Helix Express abrogates my findings.

As a computer scientist with 20 years' experience designing databases and teaching others how to do it, I've written a pile of systems in Helix, Double Helix, and Helix Express. In every case, I've found performance problems when Helix is used in a multiuser setting. Those problems have not disappeared with Helix Express, no matter how brilliantly and efficiently the collections have been designed. — DC

Conflicting Reports

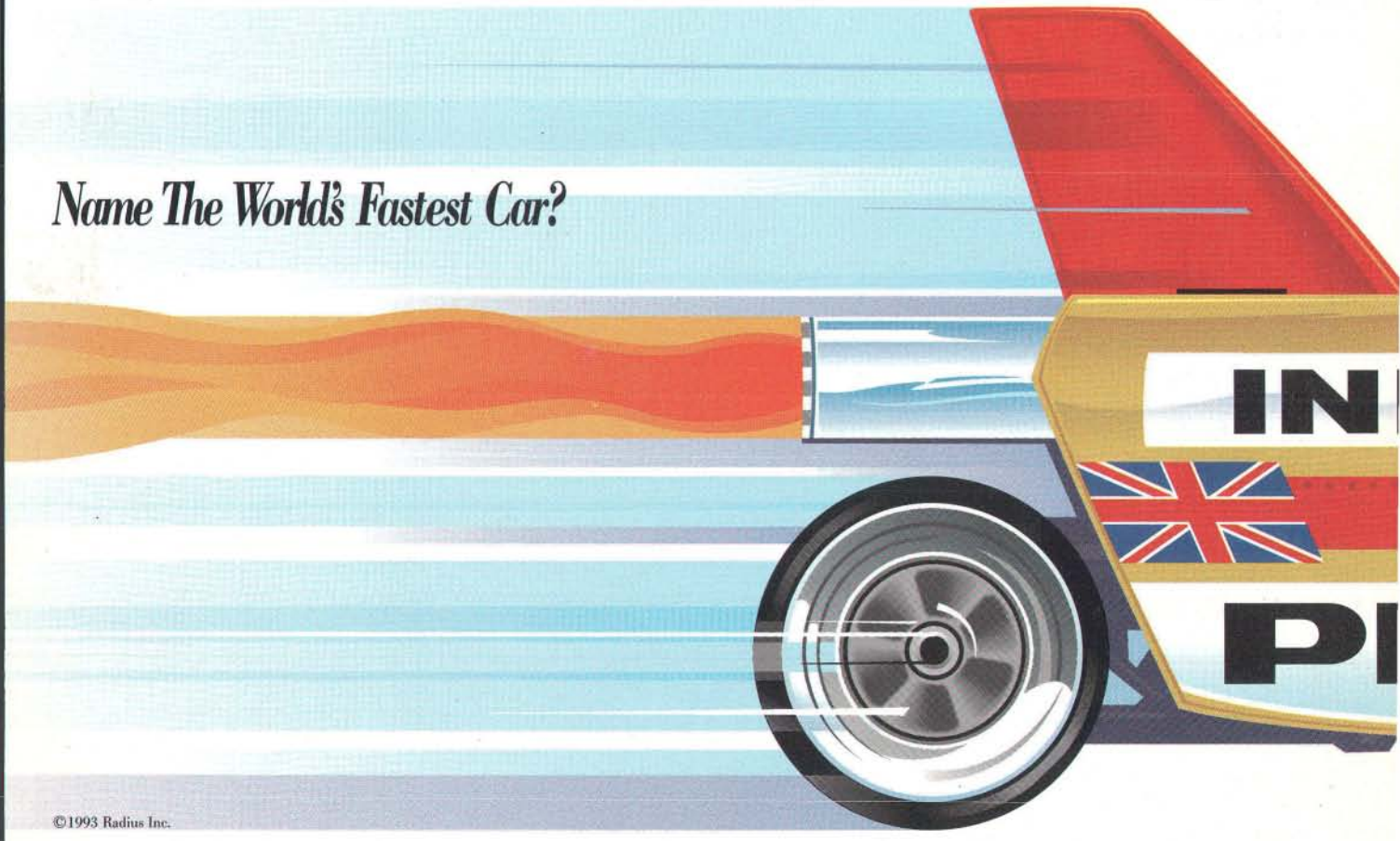
I was extremely disappointed to see the negative review of Conflict Catcher and Other Innovative Utilities (April '93, page 91). When I read the review and saw a reference to a CEIAC problem that had been corrected during the beta cycle, I knew something was amiss.

I double-checked our archived masters and test notes and determined that Eric Taub had reviewed a prerelease version of the package.

I had hoped *MacUser* would evaluate Conflict Catcher in light of the unique feature it brings to the marketplace — that is, identifying extension conflicts at restart time and at application launch time. There is no other extension manager on the market that has this feature, and judging from the level of traffic on the nets, it is a sorely needed tool.

Michael Greene
Casady & Greene
Salinas, CA

Our reviewer telephoned your company about the CEIAC problem, but unfortunately his call didn't alert your technical staff to the fact that we had been given a prerelease version of Conflict Catcher to review. Please be advised that the CEIAC problem was not a major factor in our reviewer's evaluation of the product. — KO



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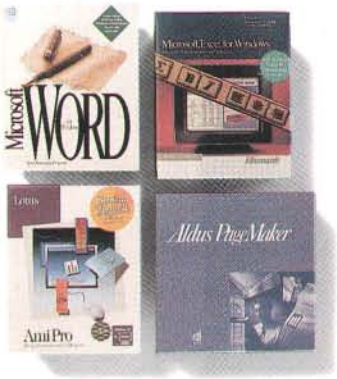

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CIRCLE 120 ON READER SERVICE CARD.

Star Performas

I was wondering why all the articles in your magazine avoid reference to Performas. They *are* Macs after all and are just the same as any other model. Please include Performas in your articles, especially when the subject applies equally to Performa users.

Velma S. Fiorina
San Gabriel, CA

You're right. Performas are "just the same" as other Macs. In fact, because most Performas have a Mac equivalent, you can translate Mac Classic to Performa 100 and so on. We'll continue to report on Apple's new Performas as they're announced, so stay tuned. — JB

Accidental Prone

I hope you didn't get too bent out of shape on receiving a one-and-a-half-mouse rating from Matt Haines (Letters, May '93, page 16) because he claimed *MacUser* was too heavy to serve as a sun shield when placed over his face when he was lying in a prone position. No wonder he had trouble: In the prone position, he would have to have had eyes in the back of his head. Now had he been in the *supine* position . . . .

Should his name come up, would you refer to Phil Donahue as the infamous left-wing talk-show host?

John Figueras
Orleans, MA

Mark TWAIN

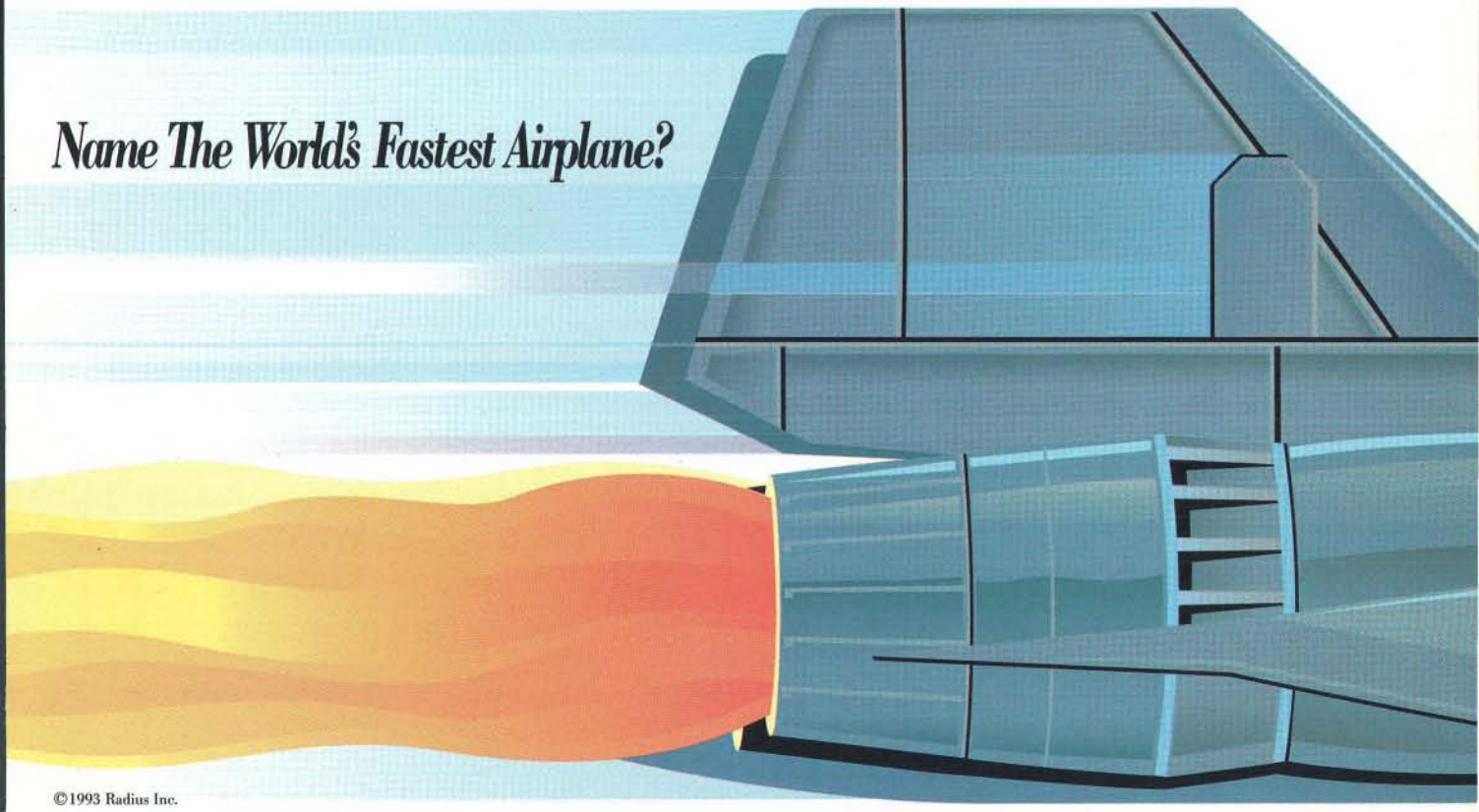
Your article "Getting the Picture: Color Flatbed Scanners" (May '93, page 106) contained inaccurate information on the Hewlett-Packard ScanJet IIc. First, a Photoshop plug-in has been available since October 1992. The scanner has been TWAIN-compatible since August 1992, and Adobe released a TWAIN plug-in in late October 1992. Second, in Table 1 (page 116), the interpolated resolution for the ScanJet IIc is listed as 400 x 400 dpi. This should be 1,600 x 1,600 dpi, which has been supported since the ScanJet Plus was introduced.

Having a section entitled "Plug-in features" in Table 1 is misleading, because the plug-in module doesn't control the scanning other than to save/scan to a Photoshop file. The actual scanning and scanning controls are handled by the scanner's own software. Therefore, the DeskScan software should have been listed. Also, you should indicate which scanners are TWAIN-compatible, because Photoshop isn't the only program that supports the TWAIN standard.

Alan B. Meyerfeld
San Diego, CA

How Transparent

I think your readers deserve to know that the May '93 color-printer review ("Picture Perfect: Continuous-Tone



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Printers," page 150) contained two substantial errors regarding the Iris SmartJet's capabilities.

First, *MacUser* tested the GA (graphic arts) ink set for printing transparencies. We recommend using the Iris ID (industrial design) ink set, which has been formulated to provide the greater density, saturation, and vibrancy that transparencies require.

Second, the article failed to mention the fact that the SmartJet can *double-strike* an image, a feature our customers find exceptionally useful for printing transparencies. With the double-strike feature operating, the SmartJet prints each raster twice, thus doubling — in a single-pass operation — the amount of ink deposited at each given pixel.

Peter Alpers
Director, Marketing Communications
Iris Graphics, Inc.
Bedford, MA

When testing the Iris SmartJet, we did use the printer's double-strike feature but not the ID ink set. However, we do stand by our assertion that the SmartJet is not the best product for printing transparencies, although its performance as a proofing device is outstanding. — PP

LC Upgrade

Russell Ito mentions that owners of the original LC now have an upgrade path for the modest price of $599 ("Compact and Colorful," April '93, page 100). But he neglects to state whether the upgrade would bring the LC to the level of the LC II or the LC III. All he said was that Apple wanted to encourage owners of the older LC to upgrade to the faster machine.

Shannon Wheatley
Beni Suef
Egypt

The kit upgrades the Macintosh LC or LC II to the Macintosh LC III. As stated in the story, we cannot recommend the Macintosh LC-to-LC II upgrade because the Mac LC II is no faster than the Mac LC. — RI

Reader Knows Best

Bob LeVitus tells Bill Marler that he doesn't know of any utility that can extract outline fonts from a printer's ROM (Help Folder, May '93, page 249). Well, Altsys' Metamorphosis Pro can do just that. I have used it many times to extract the LaserWriter fonts from my printer's memory to use with ATM, and they work just fine.

Mark Ohashi
Los Angeles, CA

The Political Situation

I noticed that Jon Zilber felt it necessary to needle Rush Limbaugh ("Armchair Headhunting," May '93, page 35) by referring to him as "the infamous right-wing talk-show host." Should their names come up, would you refer to Dianne Feinstein or Barbara Boxer as "the infamous left-wing Congresswomen from California?" Would you refer to Phil Donahue as "the infamous left-wing talk-show host?"

Of course not.

If you are trying to infuse *MacUser* with overtones of *Spy* or *National Lampoon,* I'm all for it. Given your mission, however, I believe it would be a little more appropriate if you indulged yourselves toward both ends of the political spectrum.

Gary H. Stewart
Galion, OH

So do you know about Gurgling Cods? (See "Dear Mr. Sculley," July '93, page 11). — PP

Corrections

The phone number shown for Logical Solutions ("7th Heaven," June '93, page 80) is its fax number. The correct phone numbers are 800-645-2495 and 612-659-2495.

The phone number listed for Passport Designs ("Passport Producer," May '93, page 71) is incorrect. The correct number is 415-726-0280.

The phone number given for Microtek Lab ("Getting the Picture: Color Flatbed Scanners," May '93, page 106) is its technical-support number. Microtek's general number is 213-321-2121.

In "Affordable Luxury: Two-Page Color Monitors" (May '93, page 128), a number appeared in the "Bit by Bit" sidebar on page 130 as "32,768 (21^5) shades." It should have read "32,768 (2^{15}) shades."

The phone number for Lexmark International (April '93, page 56) was incorrect. The correct number is 606-232-2000. The price of the Lexmark IBM Color Jetprinter PS 4079 is actually $3,199.

The World's Fastest Graphics Card Has Just Been Named.

Introducing Radius' PrecisionColor™ Pro.

Now it joins the cheetah, the Thrust II car and the SR-71 spyplane on the list of world-class speedsters.

Because PrecisionColor Pro is the fastest 24-bit color graphics card available for the Macintosh.® Period.

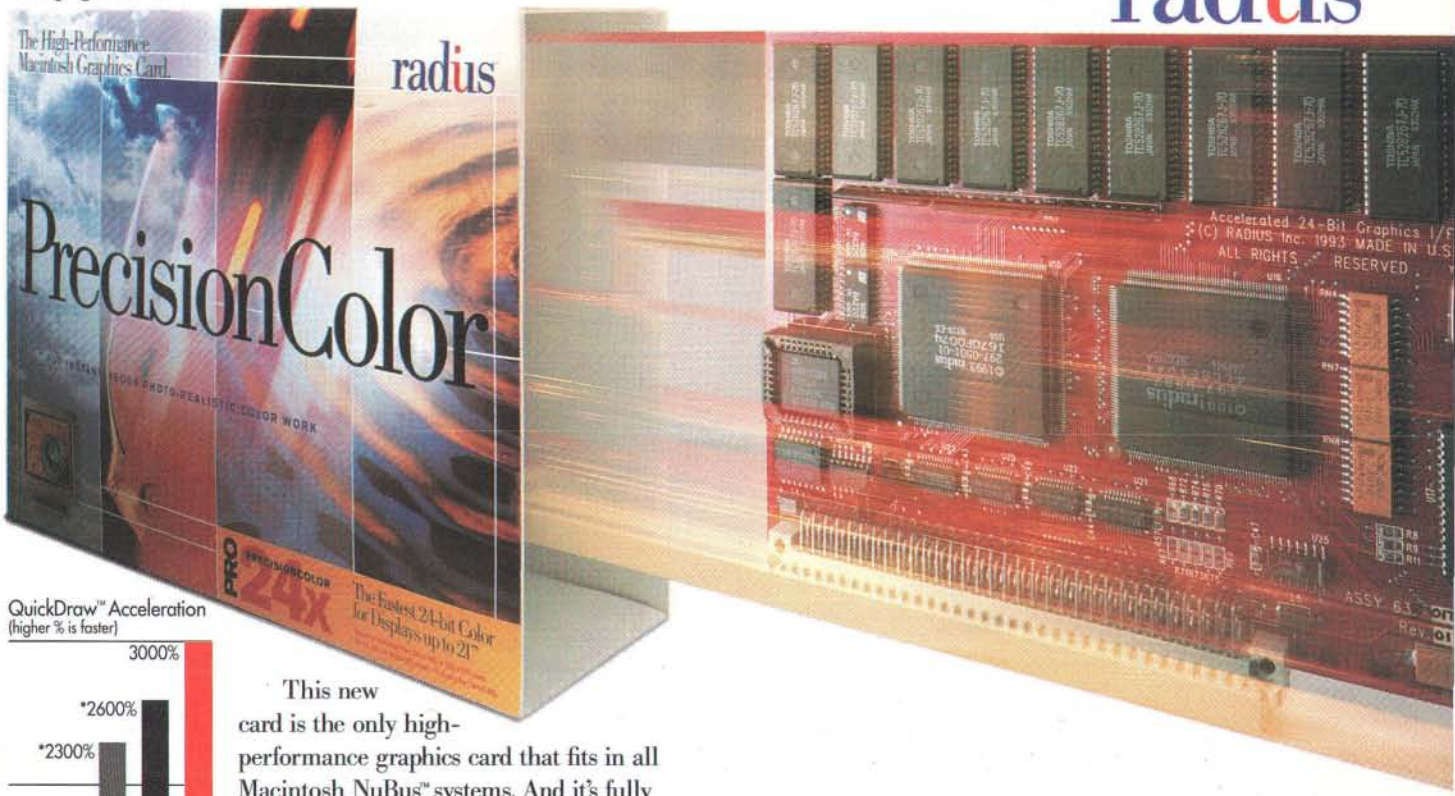
It's up to 67% faster overall than Thunder/24.™ Up to 26% faster overall than Thunder™ II. And as much as 3000% faster than your unaccelerated Mac.*

So now you can really scream through color imaging, photo retouching, illustrations, 3-D renderings, and other graphics-intensive work.

And to really accelerate Photoshop,™ there's our new PhotoBooster™ with twin DSPs, to help you run your production functions up to 15 times faster than a Quadra™ 950.

In addition to unmatched speed, PrecisionColor Pro gives you unrivaled flexibility. You get "on-the-fly" resolution switching. A single keystroke moves you between one-page and two-page views.

PRECISIONCOLOR PRO radius™



*Performance percentages from publications by RasterOps Corp. and SuperMac Technology, Inc.

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For complete details and the name of your nearest Radius reseller, call 1-800-227-2795 Ext. 10B. Or call us now at 1-800-966-7360 to receive faxed information.

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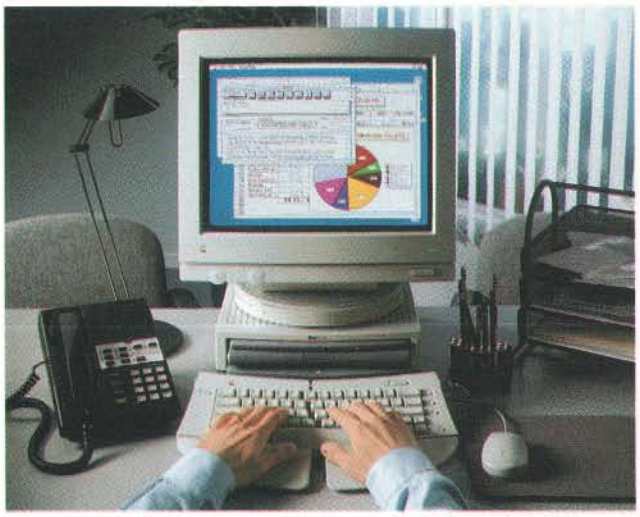
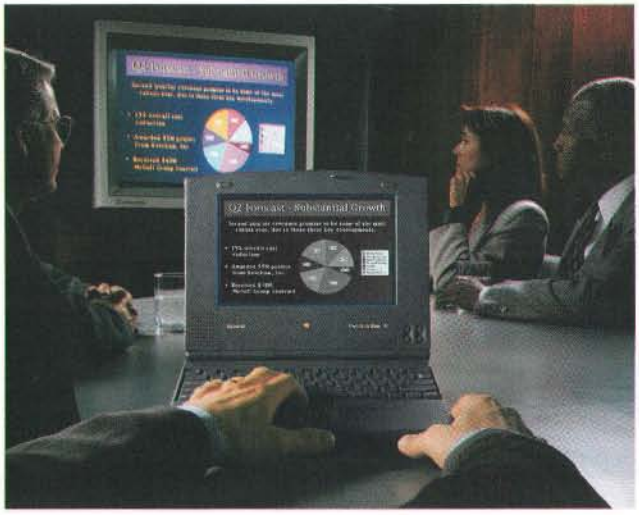
CIRCLE 68 ON READER SERVICE CARD.

8:00 Home *Over breakfast, you check your calendar on your PowerBook Duo. The day looks like it'll be a breeze. You'll put a few finishing touches on the Q2 forecast presentation that's due in a few days, return some calls and have a free afternoon.*



9:15 Your Office *You slide your PowerBook Duo into the Duo Dock and start working. Suddenly, e-mail chimes. Your boss wants you on the noon shuttle to Boston, to present the Q2 forecast to his boss. Also, a client wants to see you ASAP. You hit the eject button.*

2:50 Borrowed Office *A colleague is at lunch, so you borrow his Duo Dock. You log onto e-mail back at the home office and learn your group has just won a new account. You put this news into your presentation (and change a few colors, too).*



3:30 Conference Room *You clip on the Duo MiniDock and run the presentation from your PowerBook Duo. Everyone's impressed—especially the guy who asks a series of questions about a six-month-old project. You've got your files, so you've got the answers.*

No other computer could get

For years, you've been trying to keep up with computers. Now there's a computer that can actually keep up with you: the Apple® PowerBook Duo™ System.

It's nothing less than the most flexible, adaptable and personal computer in the world.

On the road, it's a slim, sleek and powerful notebook computer.

Model	PowerBook Duo 210	PowerBook Duo 230
Weight	*4.2 pounds*	*4.2 pounds*
Memory	*4MB exp. to 24MB*	*4MB exp. to 24MB*
Storage	*80MB*	*80MB or 120MB*
Display	*9-inch backlit*	*9-inch backlit*
Battery	*Up to 4.5 hours*	*Up to 4.5 hours*
Speed	*25 MHz 68030*	*33 MHz 68030*

In the office, when plugged into a Duo Dock, it instantly becomes a fully expandable, no-compromise desktop computer that lets you work with a full-size keyboard and up to a 16-inch color monitor.

But what really sets the PowerBook Duo System apart from conventional docking systems is a bit of engineering genius called PowerLatch™ technology. A combination of elegant hardware and intelligent software that

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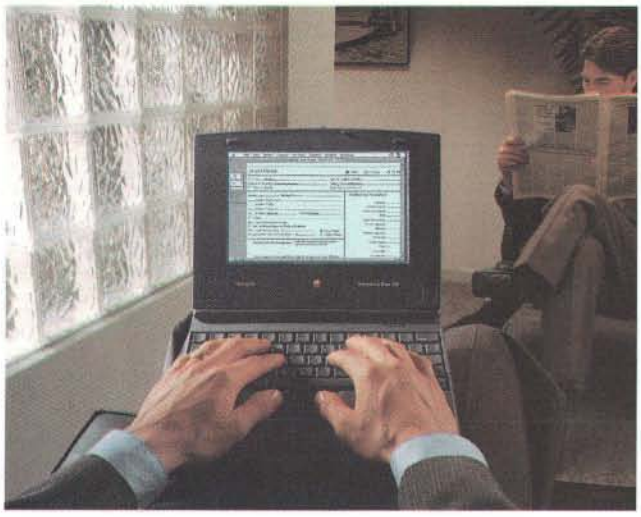
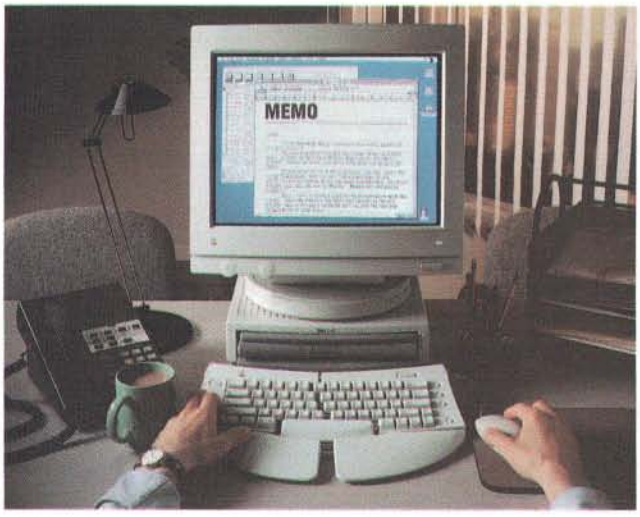


11:10 Your Client's Office *That $5 million project the client told you was off last week? It's on again. And due in two weeks. You type up job orders, which you'll fax from your PowerBook when you get to Boston. Now, however, you have to get to the airport.*

12:40 Noon Shuttle *All the files and software you use at your desktop are with you. You pull up the Q2 presentation and make the revisions to reflect the new assignment. Then you write a memo to your team, to make sure that everything's on schedule.*



7:00 Your Office *On the way home, you swing by the office to tie up a few loose ends. You see your boss. He heard the meeting went well, and wants you to fly out and present to the people in London. Tomorrow. You send out a memo to update your staff.*

8:30 Living Room *Since you've got all your files and software right there with you, you could study the new research data or finish up those performance reviews. But hey, enough is enough. You settle back in your recliner and play a few rounds of Tetris.*

you through a day like this.

lets you move in and out of the office with tremendous ease.

There are no cables to fiddle with and no complicated "reconfiguring" procedures. Just slip the PowerBook Duo into the Duo Dock, and the system automatically recognizes all your networking resources and attached peripherals.

Simply push a button, and a motor gently releases the PowerBook Duo. (It will remind you to save any unsaved files, in case you forget.) Now, wherever you go, your files go with you. You can even add an optional PowerBook Express Modem, to let you send and receive documents while you're on the road.

To experience the PowerBook Duo System for yourself, call 800-732-3131, extension 100, for the name of the authorized Apple reseller located nearest you. (If you're in Canada, call 800-665-2775, extension 910.) And no matter how dramatically things may change in your life, at least you'll always have the one power you can depend on. The power to be your best.®

PowerBook Duo from Apple

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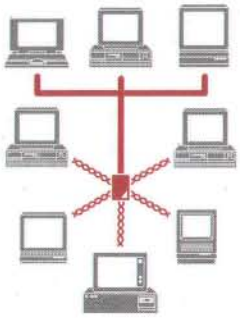
Only Asanté Puts The Power Of Ethernet In The Palm Of Your Hand.

Presenting the world's smallest and lightest SCSI-to-Ethernet adapter. Asanté™ is adding a whole new dimension to high-speed Ethernet® networking for the Macintosh®. Introducing the Mini EN/SC™, the smallest and lightest SCSI-to-Ethernet adapter you can get your hands on.

Specially designed for the PowerBook® line, Asanté's new Mini EN/SC is so small and light – a mere 6 ounces – that it's a snap to carry. It's also the perfect space-saving solution for desktop Macs® without available slots for networking. For added flexibility, the Mini EN/SC comes with SCSI-to-Ethernet connecting cables for both PowerBooks and desktop Macs.

Thin and 10BaseT Ethernet at your fingertips. The plug-and-play simplicity of the new Mini EN/SC makes it the easiest SCSI-to-Ethernet adapter to install, hands down. It's a powerful solution that puts Thin and/or 10BaseT connectivity at your fingertips. Asanté also offers a 3-in-1 SCSI-to-Ethernet adapter, the EN/SC.



The Mini EN/SC is thoroughly tested before shipping and comes backed by the same 5-year warranty and technical support as our other award-winning adapters.

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CIRCLE 86 ON READER SERVICE CARD.

To Tell the Truth

Just what is a Mac, anyway? If you're having trouble telling the bona fide Macs from the impostors, join the crowd.

Remember the old TV quiz show "To Tell the Truth"? For those too young to remember (or for those who are waiting for it to come out in QuickTime), the premise was simple. Three players — one notable for some reason or other and two impostors pretending to be the first one — sat before a panel of pundits who gave them the third degree, asking questions designed to trip up the bluffers. Based on the plausibility of the answers, the pundits voted for the one they believed was the real McCoy.

Make that the real Mac-coy, as in "Apple sure is being coy about the Mac these days." It used to be easy to spot the real Macintosh, but lately, it's become a real challenge. You'll understand why as our players sign in and the interrogation begins.

Announcer: "Number 1: What is your name, please?"

#1: "My name is Macintosh."

Announcer: "Number 2: What is your name, please?"

#2: "*My* name is Macintosh."

Announcer: "Number 3: What is your name, please?"

#3: "My name is Macintosh — more or less."

Announcer: "All right, we'll start the questioning with our first panelist. Arlene?"

Arlene: "OK, you say you're the real Macintosh, #1. Why is that?"

#1: "Because that's what I am. I was introduced in January of 1984, I run on Motorola 680x0 processors, and I was the first successful computer to sport a graphical user interface."

Arlene: "And you, #2?"

#2: "Well, Apple hasn't released me yet, but I'll run on PowerPC microprocessors that will blow away the 680x0 architecture. In fact, John Sculley says he's going to sell a million PowerPC machines by the end of 1994. Just about every major Mac-hardware and -software developer is betting its future on me, because I'll finally be able to offer power Mac users price and performance in line with the rest of the personal-computer industry. And when they switch to the PowerPC, they'll never even know they're using something different."

Arlene: "And #3?"

#3: "OK, I'm not from Apple — I'm from Microsoft. And my *real* name is Windows. But as far as computer users are concerned, if it looks like a Mac, if it walks like a Mac, if its beep sound quacks like a Mac, it's as good as a Mac. I already run on low-cost Intel-based hardware — did you know you can get a complete 486 machine for under a grand — and Microsoft is developing specialized versions of me for everything from client/server applications to consumer electronics to office equipment to telephony."

Arlene: "Hmm . . . you sound kind of defensive, #3. But I'll turn the questioning over to Kitty."

Kitty: "Yes, #3, just why are you so defensive?"

#3: "Defensive? Hardly. In only a couple of years, I've stolen the GUI leadership position away from Apple."

Kitty: "What do you say about that, #1?"

#1: "Sure, cheapskates can save money if they want to buy cheaper hardware, but Windows is just a wolf in cheap's clothing. Windows lacks all the truly important aspects of the Macintosh. Windows applications don't behave according to a set of consistent guidelines. The interface may be graphical, but it's a graphical nightmare. Windows applications don't give the same kind of visual feedback to the user — when you drag something around or when you click on a button, there aren't clues that let you know that you actually did what you thought you were doing."

Kitty: "OK, and #2 —"

#1: "Wait, I'm not finished. Have you ever tried using two different Windows machines — say a desktop and a notebook — at the same time? The darn keyboard layouts aren't even the same. On the Mac, you easily develop keyboard-shortcut habits, such as pressing Command-S, Command-Q, or Command-Z, that you don't even have to think about. You can't safely do that on a PC, because the function keys and the Alt and Esc keys are located in different places on different keyboards."

Kitty: "#2, what's your opinion about Windows?"

#2: "It depends on which Windows you mean. #3 brags about there being so many different versions of Windows in the works, but their only similarity is the name. If you think all those different-flavored operating systems are going to integrate seamlessly, I've got a bridge in Brooklyn to show you."

#1: "Yeah, and let's not forget about all the Windows wannabes from companies besides Microsoft that are just going to confuse

matters even more. Sun Microsystems has just announced its own windowing operating system that's supposed to be compatible with software written for Windows, and —"

#3: "Hey, now who's getting defensive? In the first place, forget about Sun. Its machines are going to be dinosaurs — a regular Jurassic SPARC. And who are you to say we've got confusing operating systems? Apple's got the original Mac OS, the Newton OS, the networking OS its developing with Novell, and a Mac-like interface for open UNIX systems from companies such as Sun, Hewlett-Packard, and IBM. And let's not forget Amber and Bedrock — technologies Apple is working on to support developers who are writing software for both Windows and the Mac OS. Don't forget Star Trek, Apple's version of the Mac OS that's going to run on Intel-based hardware. We haven't even mentioned Kaleida, whatever that is, or the Mac-emulation software from Quorum Software Systems that will let you run Mac software on Sun and Silicon Graphics workstations. And that new Server of yours — it's a different beast altogether. And —"

Sure, cheapskates can save money if they want to buy cheaper hardware, but Windows is just a wolf in cheap's clothing.

What's in a Name?

If you think what Apple has in store is going to force you to rethink everything you ever thought you knew about the Mac, you're right. It's already making everybody at MacUser *rethink everything we think we know about what you want to know about the Mac. Do you want to know about the Newton? How does PowerPC fit into your plans? Should we rename the magazine* Mac/Newton/PowerPC/ServerUser?

We want to hear your thoughts, but there's someone new to send them to. I'm moving on to other projects for some of our sister publications, so this will be my last column as editor-in-chief of MacUser. *Taking this space next month is the woman who will have to wrestle with these issues: Maggie Canon, a former editor-in-chief of* Macintosh Today, A+, *and* InfoWorld *magazines. Most recently, Maggie has been creating and editing conventional as well as multimedia-based publications for Apple Computer.*

I'm sure you'll find her to be a supremely confident guide through whatever the future of the Macintosh holds in store. Maggie, sign in, please.

YA GOTTA HAVE ALL THE TOOLS

Getting started with Mac graphics can be pretty complex. Drawing. Painting. Image editing. How can you be sure that you'll have all the tools you need in one handy place? You could fork over a bundle for three separate programs. Or better yet, you could just whip out your trusty Deneba artWORKS™, the handy new integrated graphics package that combines the very best of everything. For a price that's next to nothing. Click open artWORKS and in one simple-to-use software bundle you'll find complete and

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intuitive 24-bit drawing and painting power with a slew of hot image-editing tools. The result is professional-quality graphics, whether you're creating a newsletter masthead, school report, or graphics for a brochure. Uncork your creative

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WITHOUT HOCKING THE FAMILY JEWELS.

juices with a mind-boggling array of tools including all the standards plus pressure-sensitive pen, magic wand selection, water droplet, even a three color airbrush. Smooth, stretch and skew. Lasso and mask. Flip, bend, rotate and reshape. In short, do dozens of things you could never do before in a single $149 graphics program. So, put the family jewels back. Save your money. Save your time. Save your

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Deneba SOFTWARE

CIRCLE 186 ON READER SERVICE CARD.

How Butterflies Transform

The butterfly passes through several stages in its glorious transformation from egg to the completed creature that we all visualize as the butterfly. The adult female lays between one hundred and several thousand eggs throughout her lifetime each with the potential of becoming an adult butterfly itself.

Each egg, so tiny that it can only be seen by the human eye with the help of a microscope, is laid on or near a plant on which the newly hatched grub will be able to feed. These eggs are often green or yellow, but can also be found in shades of blue or red, each with a shell-like design covering it.

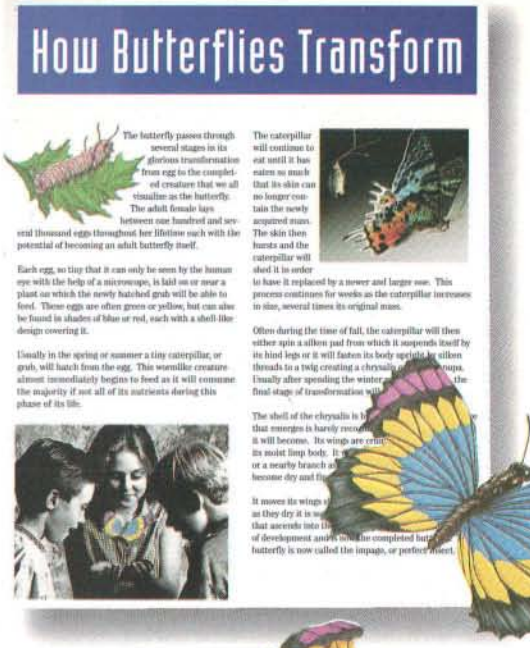
Usually in the spring or summer a tiny caterpillar, or grub, will hatch from the egg. This wormlike creature almost immediately begins to feed as it will consume the majority if not all of its nutrients during this phase of its life.

The caterpillar will continue to eat until it has eaten so much that its skin can no longer contain the newly acquired mass. The skin then bursts and the caterpillar will shed it in order to have it replaced by a newer and larger one. This process continues for weeks as the caterpillar increases in size, several times its original mass.

Often during the time of fall, the caterpillar will then either spin a silken pad from which it suspends itself by its hind legs or it will fasten its body upright by silken threads to a twig creating a chrysalis or exposed pupa. Usually after spending the winter months dormant, the final stage of transformation will take place.

The shell of the chrysalis is broken open and the creature that emerges is barely recognizable as the butterfly that it will become. Its wings are crumpled and kept close to its moist limp body. It will remain clinging to the cocoon or a nearby branch as its form gradually begins to become dry and firm.

It moves its wings slowly at first with little strength but as they dry it is soon ready to take flight. The creature that ascends into the air has been through its final stage of development and is now the completed butterfly. This butterfly is now called the imago, or perfect insect.



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DocuMorphosis

An ordinary caterpillar is miraculously changed into a vibrantly colored, graceful butterfly. It's one of nature's most awe-inspiring events.

Now, you can share in the splendor of a similar magical event: DocuMorphosis™. Transform dull looking pages into exciting, attention grabbing documents. Add excitement with logos, photographs, line drawings, charts — in 24-bit color or 256 shades of gray. See your applications enriched with new meaning and importance — with the affordable ScanMaker II, by Microtek.

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CIRCLE 179 ON READER SERVICE CARD.

Does this remind you of your system folder?

4½ Are you the sort of person who accumulates fonts, DAs and sounds as though they were going out of style?

If you are, then your system folder is as crowded as this closet.

And almost as organized.

Which is no great problem, as long as you don't mind scrolling through menus that disappear off the bottom of your screen.

But if you think scrolling is for Ancient Greeks, it's time you did what over 250,000 people have done before you.

Get out of the closet. And get into Suitcase.™

Suitcase is the award-winning utility that makes it easy to sensibly organize and promptly access your rapidly growing collection of fonts, DAs, FKEYs and sounds.

Which means you can spend more time using them and less time—a lot less—rummaging around looking for them.

You'll also spend a lot less time accessing new fonts from within applications—especially if you have System 7.

Because System 7 still makes you quit and re-start your applications before you can use a fresh font.

Suitcase doesn't.

And System 7 hasn't got a clue about which fonts you were using during your last session.

Suitcase does. And loads them for you automatically the next time you switch on your Mac.

You can pack each suitcase with just a single font or as many as 800 of them, up to 64 DAs or any number of FKEYs and sounds.

Can't remember the difference between Versailles and Monaco? Not to worry. Suitcase displays your typefaces right in the menu.

You can also group suitcases into sets, then summon all the luggage that belongs with a particular project at the click of a mouse.

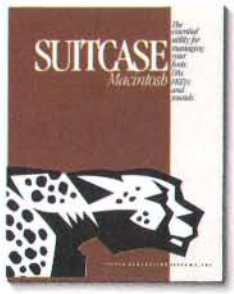
Tips are optional. But here's one for those who have neither the time nor the patience for resolving font ID conflicts.

Get Suitcase. It eliminates them. Along with a lot of wasted disk space.

That's right, Suitcase compresses your screen font and sound files by as much as 60%.

It even lets you park your screen and printer fonts on a server for all to share, making each disk on the network that much more spacious.

Like all Fifth Generation products, Suitcase is backed by our one-year money-back guarantee and our vaunted 24-hour toll-free customer support.



Finding out more about Suitcase is also toll-free. So pick up the phone and dial 1-800-666-2904.

Ask for Housekeeping.

FIFTH GENERATION SYSTEMS, INC

CIRCLE 105 ON READER SERVICE CARD.

Outside U.S. & Canada call: (44) 494-442223

ANDY IHNATKO

Dollars and Sense

When it comes to hardware, sometimes it pays to spend a little more.

Into everyone's life a little rain must fall. Hundreds of greeting-card writers have said that before me, so I'll have to go them one better: In most modern corporations, you will find the weather in the office of the person who authorizes equipment purchases moist enough to grow rice in. Behind that soggy door sits a specially bred bureaucrat who is mysteriously immune to the usual bounds of reality and who can, with the wave of a single Ticonderoga, cause your requisition for a much-needed Quadra 950 to result in the timely delivery of a third-hand 286 DOS machine. The chief export of such bureaucrats is the word *no*. You may be pleased to learn that, if the referendum passes, it soon will be legal to hunt and trap them for sport in the state of Vermont.

Even when, through efficient application of force, you convince them to buy hardware that conforms to your specifications, your chances of locking them into a particular make and model of equipment are slim; "a 9,600-bps V.42bis modem is a 9,600-bps V.42bis modem," they will tell you, for in their notion of reality, there's no difference between something that sells for $590 and something that sells for $300 less. Two kinds of ammunition can convince them otherwise, and I can provide you with one of them: the reasons why, in certain categories of hardware, spending extra dough is sometimes a good idea.

Cheap Modems

As a guy who often spends more than ten hours a day on-line, I'm glad to finally see modem prices fall far enough that folks buying their first Macs can round up their purchase price to the nearest hundred dollars by buying a decent modem. Low-cost modems work great for all beginning telecom enthusiasts and some of the intermediate ones, but in heavy-metal use, many cheap modems fall flat on several fronts.

First, they have an annoying tendency to melt. No joke. While cowriting a book on telecommunications last year, I tested about a dozen bargain-priced modems of all speeds and specifications; all but three of them gave up the ghost after ten hours of nonstop operation. They're fine for casual use, but if you're looking for something to run the office's AppleTalk Remote Access server, you'd best look elsewhere unless your office is seriously overinsured.

Cheap modems are also a bad bet if your phone lines are of poor quality. Line noise can be a problem no matter how good your modem is, but noise that more-expensive modems shrug off can bring a cheaper unit to its knees in no time. Less common but just as distressing is their tendency to bungle the feature-negotiation phase of establishing a connection. Your modem is V.42bis and properly configured and the modem you're connecting to is outfitted the same way, yet for some reason you can't establish the best connection that's possible with those features. Usually an el-cheapo modem will have a problem negotiating with another modem only if it's a specific brand, but if that particular modem happens to have been installed at your most important on-line service, you're out of luck.

Mediocre Monitors

The usual shortcomings of cheap monitors are pretty well known: distortion (the image is taller in the middle than at the top and bottom, for instance) and nonuniform focus (such as blurring at the corners). These problems are present in almost all but the best monitors and, from model to model, can vary in intensity from barely noticeable to hair-pullingly annoying.

Less publicized are the problems many monitors have dealing with heat. Although monitors won't do the big firework as cheap modems can, when you consider that a clear, stable image is the result of a lot of physics applied with a certain degree of precision, it's easy to understand how things can go out of whack as the hours pass and the cabinet's temperature rises. Better monitors feature circuitry and cabinet design that efficiently deal with the problem, but after a couple of hours of operation, your budget screen's image can shrink, pop completely out of focus, or differ in color significantly enough that what was a greenish Mr. Spock on your desktop Mac becomes a blue Smurf on the boardroom's projection screen.

Oh, and a Consumer High Five (sarcasm) to MacProducts USA. When a reader complained that the Panasonic monitor he'd bought from MacProducts became unusably blurry after an hour's use, the company more or less told him, "What do you expect from a cheap monitor?" Such candor is refreshing, but equipment whose behavior changes over time has to be considered defective.

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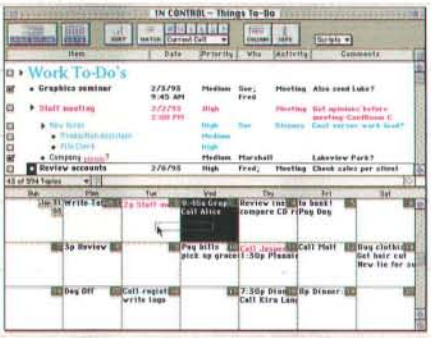

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Suspect Storage

Some good news on this front: A drive mechanism is a drive mechanism is a drive mechanism, so rarely are there significant functional differences between one storage device and another, as long as they both have the same mechanism.

The trade-offs lie in the enclosures that encase the mechanisms, and even then you're talking mostly about creature comforts. A more expensive drive sometimes features a much more studly power supply, switched outlets, a lower operating temperature, SCSI cables that didn't come from Wal-Mart, and a SCSI-selection switch that goes only to 7 (thereby avoiding the incorrect IDs that arise when a switch has been bumped to 8 or 9).

To bring their prices down, some vendors have been advertising wonked-out memory cards that simply don't make the grade.

One annoying characteristic of hard drives that isn't always linked to price but that is more likely to affect budget drives is hellacious noise. If the manufacturer chooses a fan and cabinet design carefully, the cacophony can be kept to a low hum. When units are just thrown together, though, the din can be too much to ignore, particularly if you do a lot of your work late at night. Keep in mind that the smaller the enclosure, the noisier the drive will seem, so it's possible that a $450 drive in a zero-footprint case can be easier to live with than a $700 jobbie encased in a sleek little brick.

PowerBook Memory

Just when RAM became plentiful enough that vendors can now sell quality SIMMs as inexpensively as they can sell useless, hacked-together components, along came the Heinz 57 varieties of PowerBook RAM cards, and now we're back in a great big joojooflop situation. There are now several categories of PowerBook RAM to suit Apple's physical and technical specifications for the various PowerBooks. Alarmingly, in order to bring their prices down, some vendors have been advertising wonked-out memory cards that simply don't make the grade.

For instance, many vendors advertise cheap memory designed for the 140 and the 170 as being compatible with the 160 and the 180. Although that's technically true, 140 and 170 memory is much slower and will cause a performance hit when it's used in a 160 or a 180. Then you have those vendors who sell cards for the Duo using standard pseudostatic RAM instead of the new wintergreen-flavored self-refreshing variety used in the Duos; some of them even add insult to injury by, again, packing in RAM of the wrong speed. These doubly damned RAM cards can work flawlessly but can also be the source of frustratingly vague system errors. (Disklosure Korner: Technology Works, a company that makes and sells its own, legit RAM-expansion products, first brought this particular problem to my attention, but the facts do check out.)

OK, so it's hard to keep up with RAM technology. But it's not as if vendors are shipping boards that don't even fit, huh? Er . . . well, some vendors can't even get *that* part right. No matter which PowerBook model you own, there's a chance that your third-party RAM upgrade will feature a clumsily designed card that is nigh impossible to install. Getting a good fit was difficult enough with the relatively simple original line of PowerBooks, but now there are outfits selling cheap 160/180 RAM that was designed without accounting for those PowerBooks' semibulky heat sinks — the card just won't go down all the way, and you'll never get the keyboard reseated properly.

The Bottom Line

I have a little rule: When you're spending someone else's money, you can afford the best. Use this column to beat The People Responsible into giving you the high-quality hardware and components you require. If you're blowing your own dough or are in some bizarre fashion being held accountable for your department's budget, be sure to ask a wheelbarrowful of questions before scooping up a fabulous low price.

Terrific bargains are indeed out there if you look for them, but the less money you're willing to spend, the more time you have to invest in making sure you're not just getting what you — or that bureaucrat — paid for.

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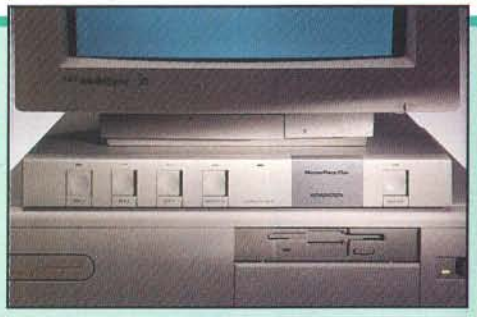

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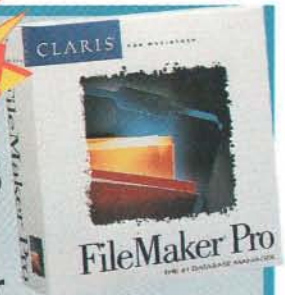

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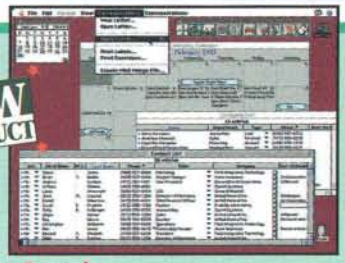

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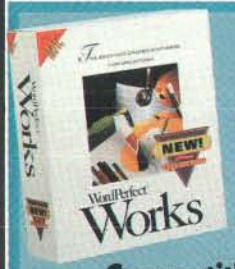

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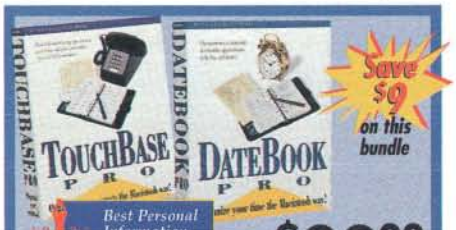

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Too Many Macs!

Apple is turning out new Macs way too fast.

Apple Computer is ripping you off.

But it all makes perfect sense. Apple just had a little money problem, and when it evaluated all the possible solutions, ripping you off won.

The rip-off characterization is not original with me. I read it in the recent blaze of incendiary letters and on-line flames set off by a certain well-known trend in Apple's product releases.

The cow that kicked over the lamp was Apple's release of the Centris line, making the IIvx obsolete four months after its release. Users have complained that Apple is turning out new Macs too fast, not providing a reasonable upgrade path, often dropping models from the line within a year of their release — all in what looks suspiciously like an effort to trick users into upgrading more often than necessary.

Yep, that sounds about right. Maybe I should explain why Apple *had* to institute a policy of accelerating planned obsolescence.

A few years ago, Apple's desktop-market share started to shrivel up and the company was forced to prune its prices. Now, Apple has always depended on premium prices and fat margins to seed its vital research-and-development efforts. Without that flow of innovation from its R&D roots, Apple would drop and rot, and without premium prices and fat margins, that sap don't flow.

Apple scratched its head and enumerated its options. It could

1. Increase the proportion of its income that comes from software, which has better margins. Apple is charging for system-software updates, but that's peanuts compared with, say, starting an application-software subsidiary and competing with its own third-party developers. Too late. Already did that.

2. License its technologies to other companies. Apple's getting into dealware big time, but the best of the deals will pay off only down the road.

3. Figure out what it is that's keeping Macs out of traditional PC markets (beside price), and fix it. That's what the Enterprise Systems Division is supposed to be doing, but poaching the other pastor's flock is not easy and ESD is still working on its sermon.

4. Create new markets by exploiting its R&D efforts. Sure, and name products after a friendly ghost or a cookie. But although in the long run, R&D should pay for itself, counting on it in the short run to win back lost market share would be way stupid, which is not the Macintosh Way.

5. Break markets open by repackaging existing machines. The Performa brainstorm: If you rename it, they will come. Probably not, but labels are cheap.

6. Sell more Macs to its existing customer base.

As they say in church, Bingo.

When the flock shrinks and the collection plate starts coming back lighter, does the preacher ask the remaining faithful to dig a little deeper? Is the pope Catholic? Do columnists ask rhetorical questions?

One of Apple's great untapped resources has always been its deeply loyal customers. Apple is just tapping that resource.

Roll 'em Over

You can't fault the logic. You were already recycling your Macs; statistics say most Macs sold today are bought by people who already own one. It was a simple matter of inducing you to roll 'em over a little faster. Do you see now that Apple *had* to do it? Expect to see the length of Apple's model year drop to about three months by fall and more models to go the way of the IIvx.

If it works, and it should, the strategy will bring Apple closer to those comfortable margins to which it has become accustomed. And it's not only Apple that will benefit. Although forcing users to upgrade their Macs doesn't really create any third-party hardware or software opportunities, my fellow columnist Andy Ihnatko is thinking about a IIvx version of his popular turn-your-512K-Mac-into-a-fishbowl project.

But the important thing to remember is that it's a shared sacrifice. Apple is investing your money in such important R&D efforts as the Taligent operating system. This is, by all reports, a hot piece of software. There's no apparent technological reason why the Taligent operating system on suitable new hardware couldn't obsolete the entire current Apple product line next year.

Of course, it may already have occurred to someone at Apple that there is a difference between planned obsolescence and sawing off the limb you're sitting on. If so, Taligent is probably even now being reengineered to make it a little less threatening, a little less revolutionary, a little less powerful.

But this too would make perfect sense.

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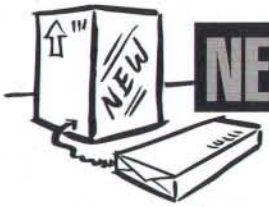

NEW ON THE MENU

Give the same engine to two different manufacturers, and you'll get roughly equivalent printers — or so you'd think. Think again. **Apple and Hewlett-Packard** have built **new personal laser printers** around the latest engine from Canon, but the results are wildly different.

The engine itself is a 4-ppm, 300-dpi model that uses microfine toner, and it's the first Canon engine to feature an instant-on fuser. In fact, it's so automatic that the printers don't even require an on/off switch. Instead of going through a warm-up cycle, this engine heats the fuser only when it's printing and goes to sleep when it's idle, yielding significant power savings.

The **Personal LaserWriter 300** is Apple's **lowest-priced laser printer** ever (expected to be around $700), but only Performa dealers will sell it.

A QuickDraw printer, the PLW 300 comes with GrayShare, for printer sharing, but it has no PostScript or LocalTalk port, so it can't be networked. It includes 39 TrueType fonts but no resolution-enhancement options of any kind.

Meanwhile, Hewlett-Packard got ahold of the same engine and went whole-hog with it. The **HP LaserJet 4ML** ($1,279) is quite probably the most sophisticated, **most feature-packed printer in its price class.**

To the 4ML, HP added just about every option you could ask for: PostScript Level 2, PCL 5, HP's RET (Resolution Enhancement Technology), LocalTalk and parallel ports with automatic port switching, 80 scalable fonts (35 PostScript, 35 Intellifont, and 10 TrueType), a 20-megahertz Intel 80960 RISC processor, and 4 megabytes of RAM, all for a marginally higher street price than that of the PLW 300.

HP even went so far as to add a unique economy print mode, called **EconoMode, that actually cuts toner use in half.** HP's EconoMode printing stays legible — even at small point sizes — because EconoMode always prints the leading edge of the character or graphic at full resolution.

The Personal LaserWriter 300's features are pretty bare-bones; even the lowly Select 300 offers resolution enhancement, and it costs almost the same. For only a few hundred dollars more than the PLW 300, HP's LaserJet 4ML is a steal. It's feature-rich and feature-complete, and EconoMode is innovative. Sometimes, what's inside isn't all that counts.

Up to Date . . .

Version 1.5 of **MacProject Pro** brings AppleScript support to Claris' project-management package. Another major improvement is support for Microsoft Project 3.0's MPX format, so MacProject users will be able to share their work with Project users on Windows machines as well as on Macs. 408-727-8227. $599. Version 1.1 of **After Effects** is the first upgrade to CoSA's QuickTime special-effects package. Improvements include control over effects parameters and faster compositing. 401-831-2672. $1,295. Version 2.0 of **Passport Producer,** Passport Designs' multimedia-integration package, now supports interactive elements, path-based animation, and external-device control. 415-726-0280. $495.

By Russell Ito

The Office Color Printer

Until now, high-quality, plain-paper color printing has meant big trade-offs in cost and complexity, but Hewlett-Packard may be about to change that: HP's DeskJet 1200C/PS is the fastest, sharpest color inkjet printer we've seen.

A PostScript Level 2 model, the 1200C/PS uses an entirely new print-head design with twice as many ink nozzles per head (104 versus 52) as were on earlier HP inkjet printers. The new printing technology lets the 1200C/PS print graphics at 300 x 300 dpi and text at resolutions as high as 600 x 300 dpi. In its high-quality mode, the 1200C/PS uses the same RET (Resolution Enhancement Technology) that HP developed for its LaserJet line of laser printers. To keep the engine moving, HP chose an 11-megahertz Intel 80960SA RISC processor as the CPU and combined it with 4 megabytes of RAM. The result is a monochrome-text speed of 6 ppm (pages per minute) in normal mode (7 ppm in fast mode) and a color-graphics speed of 2 minutes per page (mpp), more than 1 ppm in fast mode.

To keep the 1200C/PS's output as sharp and vibrant as possible, HP adapted the paper-preparation and drying technology it introduced in the PaintJet 300XL. When you select the paper type in the Print dialog box, the printer automatically sets the amount of heat to be applied so that the ink will dry immediately with a minimum of paper warping. And with its finer print head, the 1200C/PS produces output that isn't marred by the banding that plagues many other inkjet printers.

The 1200C/PS comes with LocalTalk and parallel ports standard and supports automatic port and language switching between PostScript and PCL 5 with GL/2. The JetDirect interface cards used in the LaserJet series also work with the 1200C/PS, so you can also use other network interfaces, including Ethernet.

Hewlett-Packard, Direct Marketing Organization, P.O. Box 58059, MS511L-SJ, Santa Clara, CA 95051; 800-752-0900. $2,399.

Hewlett-Packard's newest inkjet printer, the 1200C/PS, combines PostScript Level 2 with superior speed and excellent color rendition — all for less than $2,500.

The PowerBook 145B replaces the 145, at a lower price (as much as $600 less). But to save cost, Apple's not including a microphone or System 7 disks.

Penny-Wise PowerBook

The PowerBook 145, the bottom of the PowerBook line, hasn't garnered much notice lately, so Apple has decided to slash its price. The new PowerBook 145B, which replaces the 145, is Apple's lean-and-mean PowerBook, listing for $500 to $600 less than the 145 (depending on configuration).

To cut costs, Apple put all 4 megabytes of RAM on the daughterboard, so you can add a 4-megabyte SIMM, for a maximum of 8 megabytes, without scrapping 2 megabytes as you had to do before. Apple has also removed from the 145 bundle the microphone (no loss) and the System 7 floppy disks (potentially, a big loss).

Although the 145B includes a simple backup/restore utility, the lack of any System 7 disks means you're out of luck in the event of a system corruption that requires a full System 7 reinstall. Apple doesn't even offer a convenient way to get the disks quickly. Your only options are to buy the System 7 Upgrade Kit or to get the disks through a local user group. Apple's recommendation appears to be: "Well, you should have backed up your system first . . . ." Imagine the fun of doing a full restore with a single floppy-disk drive.

Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014; 800-538-9696, 408-996-1010. $1,649 (4/40); $1,899 (4/80).

Premiere Part 3

With Premiere 2.0, Adobe moved toward a better integration of Premiere with Photoshop; the latest incarnation of Adobe's QuickTime-editing package pushes the high end even higher.

Better performance overall was a major goal, so Premiere 3.0's previews and movie building are significantly faster. You can run previews from disk at the fastest frame rate your CPU offers, and Premiere compiles and caches only those sections of a movie that have changed since the last preview. Compiling as you go makes movie building faster, because Premiere 3.0 doesn't have to reprocess transitions and effects.

Adobe also added layers and batch processing to this version of Premiere. As many as 97 superimpose tracks and 99 stereo-audio tracks are available for compositing.

Batch processing lets you select and digitize several video clips at once, speeding the process of acquiring digital video.

Adobe Systems, Inc., 1585 Charleston Road, P.O. Box 7900, Mountain View, CA 94039; 415-961-4400. $695.

Movie Movie

SuperMac Technology's VideoSpigot helped jump-start QuickTime, but image quality was never VideoSpigot's strong point, and it couldn't digitize audio at all. Seeing the opportunity, Sigma Designs has introduced its Spigot-killer: Movie Movie, a low-cost, high-quality video digitizer.

Movie Movie is a complete product in a single 7-inch NuBus card. It can capture up to full-screen (640-x-480-pixel) video at 16 bits (32,000 colors). Movie Movie can also digitize audio at 8 bits (22-kilohertz sample, mono). Movie Movie's image quality is significantly better than VideoSpigot's, and its motion is much smoother. Depending on the image size and the computer used, Movie Movie's frame rates can approach 30 fps (frames per second), but your average frame rate for a 320-x-240-pixel image will probably be 12 to 15 fps.

Sigma Designs' Movie Movie multimedia card offers better video quality than the VideoSpigot — plus audio — for a bargain price.

Sigma offers Movie Movie in two configurations: with and without DiVA's VideoShop, with a free upgrade to VideoShop 2.0.

Sigma Designs, Inc., 47900 Bayside Parkway, Fremont, CA 94538; 510-770-0100. $349; $449 with VideoShop.

PowerBook Assistance

PowerBook-specific utilities are revitalizing the utilities business, and Apple has jumped on the bandwagon with its own bundle. Apple's new PowerBook File Assistant package has some functions in common with its competitors; some of its abilities, however, are unique.

File Assistant is a file-syncing application that can keep any two files, folders, or volumes in sync, whether they're local, on a network, or removable. The Interface is basic, so setup is easy.

The File Assistant package includes several power-conserving options from Ever-Watch, Apple's battery-saving technology. The current PowerBook Display control panel, which supports automatic screen dimming, is included, so owners of earlier PowerBooks can now get that function. The File Assistant package also includes a Persistent RAM disk that automatically saves its contents back to the hard disk on restart and shutdown and reads in data at startup; an Fkey for instant sleep; and Always AppleTalk, a module that eliminates the need to restart when you want to turn AppleTalk back on after starting up with it off.

For those who work away from the office, File Assistant includes a deferred-printing module called Later Laser, which allows you to assign documents to a printer and then print automatically the next time you're connected to the network where that printer resides. Auto Remounter/SCSI-Sleep automatically remounts network volumes when the PowerBook comes out of sleep or is restarted and automounts any SCSI devices that were attached while the machine was asleep. And to round things out, there's a cursor finder.

Apple Computer, Inc. 20525 Mariani Avenue, Cupertino, CA 95014; 800-538-9696, 408-996-1010. $79.

— *Russell Ito*

NewsLine

Reports and Analysis

Apple's Own OLE

CUPERTINO, CA — Making a move that many observers considered a preemptive strike against Microsoft's pending OLE 2.0 for the Mac, Apple announced its own compound-document architecture at its recent annual developer's conference. Like OLE, Apple's project, code-named Amber, will let users build documents by assembling them from disparate parts — for example, graphics, spreadsheets, and text — while retaining native, in-place editing capabilities for each part. Amber is not expected to ship to users until the first half of next year. Microsoft has promised OLE 2.0 for the Mac by the end of 1993.

SyQuest Loses Restraint

SANTA CLARA, CA — SyQuest Technology's legal move to prevent the French manufacturer Nomai, S.A., from distributing what SyQuest charges are "counterfeit" SyQuest cartridges in the U.S. has been denied by a referee in the Superior Court of California, pending a trial. In requesting an injunction, SyQuest charged that the French cartridges are packaged in a way that makes them appear to be genuine SyQuest units. SyQuest also claims that the French models suffer from manufacturing defects, including mechanical problems and contamination, that can cause catastrophic failure. Following the referee's decision, Iomega, manufacturer of Bernoulli cartridges and SyQuest's long-time rival, announced that it had signed a binding letter of intent to begin distributing Nomai units by the end of this summer.

Symantec Buys Contact

CUPERTINO, CA — Symantec continues diversifying its product line. The company has created a new contact-management product group that it hopes will rival the success of its Norton-utilities group. Symantec recently purchased Contact Software International, the developer of Act!, a contact-management package that has been very successful on the PC and is now available for the Mac. Contact Software's operations, which had been divided between Carrollton, Texas, and Foster City, California, will be consolidated at Symantec's Cupertino headquarters.

Scitex Buys In to RasterOps

SANTA CLARA, CA — Following three bad quarters' worth of earnings, RasterOps decided to look elsewhere for cash, and it worked: The company has received a $10 million investment from prepress giant Scitex. In exchange for its money, Scitex received 13 percent of RasterOps' stock, making it the company's largest single shareholder.

— *Russell Ito*

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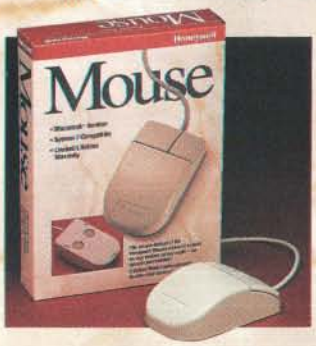

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Fast and Active: The PowerBook 180c

Apple's latest PowerBook combines vibrant colors with top-notch performance.

By Russell Ito

You can't always get what you want. That pretty much sums up *MacUser* Technical Director Henry Bortman's reaction last April to Apple's first color PowerBook, the 165c. Henry admired the overall quality of the 165c's passive-matrix screen, but he didn't warm to its sluggish response (ghosting images, dull whites, echoed cursors, and the like). What he really wanted was a PowerBook with an active-matrix color display that would yield fast redraws, no ghosting, pure whites, and vibrant colors — in other words, the PowerBook 180c, the new top-of-the-line PowerBook.

From the outside, the 180c looks almost identical to its monochrome parent, the PowerBook 180. And that's as it should be, because internally the 180c is identical to the 180. It uses the same 33-megahertz 68030 processor and 68882 math coprocessor, has the same RAM capacity (4 megabytes standard, expandable to 14 megabytes maximum), and has the same ports on the back (ADB, printer and modem serial, SCSI, audio-in, audio-out, and video-out). What is different is the display.

Little Big Screen

When you open a 180c, you're immediately struck by the display — that's even before you've turned the computer on. What's unusual is its size: The 180c boasts the smallest — and ironically, also the largest — screen of any PowerBook.

Measuring just 6.75 inches wide and 5.25 inches high, the 180c's display has a diagonal measurement of only 8.5 inches. This seems especially tiny when compared with the screens on earlier, monochrome PowerBooks, such as the 140 and 170, which have screens with 8.5-x-5.5-inch dimensions. In terms of physical dimensions, the 180c has the smallest screen Apple has put into a PowerBook.

Why the change? Apple must purchase its displays from active-matrix-panel manufacturers, which have settled on a standard panel size of 640 x 480 pixels in an 8.4-inch-diagonal panel — which is where the irony kicks in. You see, at 640 x 480 pixels — the same dimensions as those of a standard 14-inch display — the 180c's display is the *largest* screen Apple has ever put into a PowerBook. Every other PowerBook has a 640-x-400-pixel screen. But packing all those pixels into such a small package means that those pixels must be smaller, so the 180c has the highest resolution of any PowerBook to date: 93 dpi versus the previous standard of 77 dpi.

With its 8-bit (256-color) video circuitry (the same as in the 180), the 180c has more than enough colors for most presentations, and it can even be used as a presentation platform. Because the 180c's active-matrix panel has such a wide viewing angle, it's perfectly suitable for presentations to small groups.

A 180 in Color

Because the PowerBook 180c has the same CPU and memory capacity as the 180, it performed within percentage points of the 180 in our CPU-intensive Excel and FileMaker Pro tests (see Figure 1). Where we saw big differences between the 180c and its relatives the 165c and the 180 was in our redraw tests.

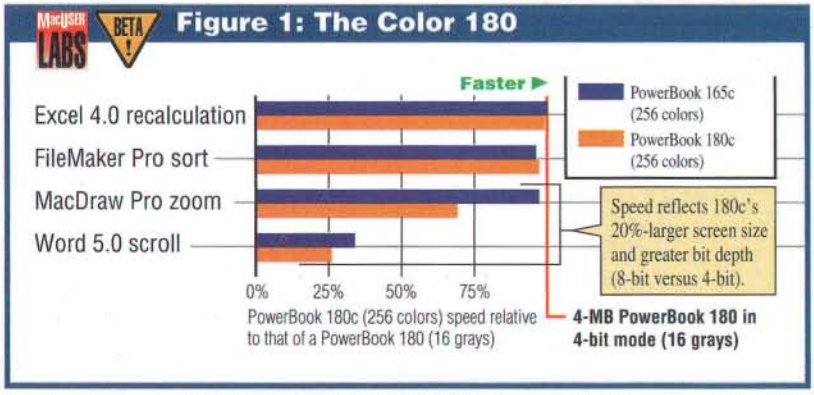

Figure 1: The color, active-matrix PowerBook 180c matched the gray-scale 180 in the CPU-intensive tests. In the redraw tests, however, the 180c's greater bit depth and its 20-percent-larger screen slowed it down. The larger pixel dimensions of the 180c's screen also explains the 180c's speed relative to that of the 165c.

PHOTOGRAPHY: WALT DENSON; SCREEN IMAGE: © 1968 BILL GRAHAM #140 ARTIST, RICK GRIFFIN AND VICTOR MOSCOSO

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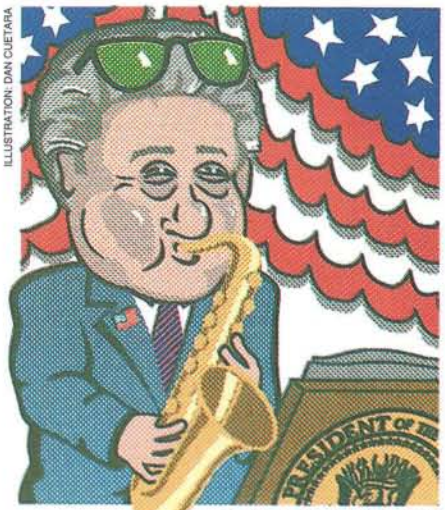

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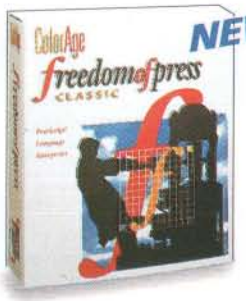

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CIRCLE 91 ON READER SERVICE CARD.

A first glance at our performance chart would seem to indicate that the 180c can't cut the mustard when it comes to display speed. For example, it was only a quarter the speed of a PowerBook 180 when scrolling through a 30-page Word 5.0 file and not even three-quarters the speed when zooming out of our MacDraw Pro file. The explanation of the 180c's seeming sluggishness is twofold.

First, there's that active-matrix panel. At 640 x 480 pixels, the 180c has to draw 20 percent more pixels than the 180 does. Not only that, but the 180c also has to deal with twice as much data, because it's pumping 8 bits of data to the screen instead of 4 bits.

Second, the 180c uses essentially the same video architecture as the 165c does. Instead of using dual-port VRAM chips, which can read in data from the CPU and simultaneously write it out to the display, Apple used standard DRAM, which can do only one or the other task at a time. As a result, the display has to wait for the video circuitry to read in data before it can write it out.

Is It What You Want?

Because the 180c's display is so different, some questions still remain. The smaller image size could cause some additional eyestrain among users who work while in transit.

Another big, big question is battery life. Apple estimates the 180c's usability at between an hour and an hour and a half per battery, but we think that's pretty optimistic. Because many of us get a battery life of only about an hour and a quarter with monochrome PowerBooks, it seems unlikely that the 180c can have a *longer* battery life.

Deciding between the PowerBook 165c and 180c will probably come down to two factors: performance and money. If you can't settle for anything less than the best in color performance, there's no choice: The 180c is definitely the way to go. You'll get one of the fastest PowerBooks available and excellent color. On the other hand, you'll have to pay for the privilege. Compared with a similarly equipped 165c, the 180c will probably cost about $800 more per model: $4,159 for a 4/40 configuration, compared with $3,399, and $4,519 for a 4/160 configuration, compared with $3,759. The 180c is also available in a 4/160 version, which includes an Express Modem and its software, for $4,769.

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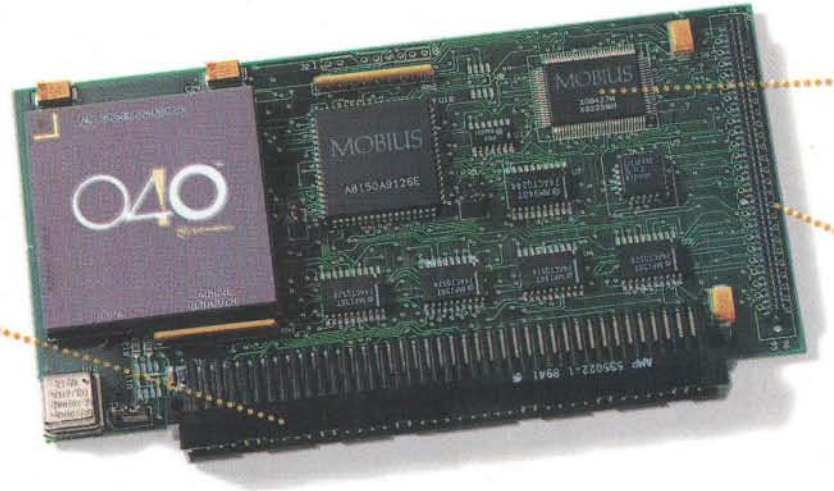

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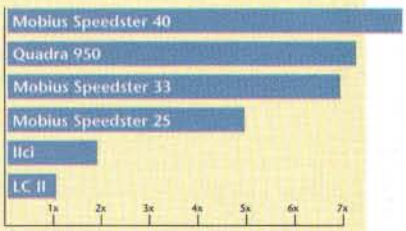

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5320 PowerModem 150. 6961 Pow.Mod. II 229.
7798 PowerModem III.... 325. 7786 IV.... 359.
★ Sophisticated Circuits ... 30 day MBG
7425 PowerPad... 79. 7419 w/QuicKeys.. 119.
★ Spinnaker Software ... 30 day MBG
1760 PowerRunner Bundle ..... 95.
★ Symantec ... 30 day MBG
1199 Norton Essentials for PowerBook..... 87.
★ Targus ... 60 day MBG
11207 Leather PB Case 89. 1305 Universal 69.
7369 Notepac 35. 6037 Premier Leather Case 169.
Utilitron, Inc.
3012 PowerSwap *(Swap batt. w/o shutdown)* 25.
★ Zoom Telephonics ... 30 day MBG
10737 FaxModem PBK ..... 92.

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★ Aatrix Software ... 30 day MBG
8914 PayCheck.. 49. 8079 Hi! Finance... 79.
Abacus Concepts
7106 StatView 4.0 ..... 439.
★ ACI US ... 30 day MBG
5618 4th Dimension 3.0.1 ..... 575.
★ Advanced Software ... 30 day MBG
8051 InTouch 2.0 55. 9049 DocuComp II 99.
11795 InTouch/Managing Your Money Bundle 65.
★ Aldus ... 30 day MBG
11558 TOUCHBASE PRO 3.0 ..... 49.
11557 DATEBOOK PRO 2.0..... 49.
11559 TOUCHBASE PRO/DATEBOOK PRO Bun. 89.
Amaze, Inc.
3582 The Far Side Daily Planner 2.0 ..... 39.
★ Attain Corporation ... 60 day MBG
8465 IN CONTROL 85. 11545 Dynodex Bun. 99.
★ Avery ... 60 day MBG
7446 MacLabel Pro 1.5 ..... 48.
★ Banner Blue ... 30 day MBG
3548 Org Plus For Macintosh 1.0..... 125.
★ Baseline Publishing ... 30 day MBG
8881 Thunder 7 1.5.2 ..... 55.
Broderbund Software
3608 MacUSA... 29. 3356 MacGlobe..... 34.
★ CheckMark Software ... 60 day MBG
5863 MultiLedger 3.0 225. 5862 Payroll 5.0 169.
★ Claris ... 30 day MBG
3903 ClarisWorks 2.0.. 199. 11472 Upgrade 69.
3836 FileMaker Pro 2.0 268. 4752 Upgrade 89.
1745 MacProject Pro... 399. 2190 Upgrade 99.
11202 MacWrite Pro..... 169. 11475 Upgrade 69.
Contact Software
7636 ACT! 249. 10317 ACT! Comp. Upgrd. 91.
★ Dow Jones ... 30 day MBG
1942 Market Analyzer Plus 2.04 ..... 225.
IdeaFisher Systems, Inc.
11721 IdeaFisher ..... 95.
★ Inspiration Software ... 30 day MBG
11269 Inspiration 4.0 ..... 159.
★ Intuit ... 30 day MBG
11845 Quicken 4.0 ..... 39.
★ Lotus Development ... 60 day MBG
11580 Special: 1-2-3 Mac & DeltaGraph Pro Bun. 99.
MECA
2796 Managing Your Money 5.0 ..... 32.
★ Microlytics ... 60 day MBG
7820 Random House Encyclopedia 1.0 ..... 57.
MicroMat Computer Systems
11794 MicroProbe ADB 69. 3732 MacEKG II 89.

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3800 *WordPerfect 2.1.3*—World-class word processor and grammar checker now come together into one powerful product to provide you with unparalleled document creation capabilities and features..... **$295.**

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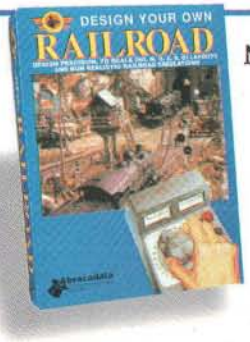
5454 *The Microsoft Office 3.0*—Increase office productivity with the latest versions of *Excel, Word, PowerPoint,* and *Microsoft Mail* (includes licensing for one workstation for use with your existing Microsoft server)..... **$475.**

★Microsoft ... 30 day MBG
2884 Works 3.0... 155. 8173 Upgrade ..... 79.
3669 Excel 4.0.... 295. 5237 Upgrade ..... 125.
4902 Word 5.1..... 295. 1503 Upgrade ..... 125.
5454 The Microsoft Office 3.0 ..... 475.
★Niles & Associates ... 30 day MBG
4602 EndNote 1.5.1.. 85. 8010 Plus 1.3 .. 142.
Nisus Software
11189 Nisus Limited Flag Edition 3.4..... 239.
★Nolo Press ... 30 day MBG
2981 WillMaker 4.0 35. 1204 Living Trust 43.
★Now Software ... 30 day MBG
1793 Now Up-To-Date 65. 2366 *(10 pack)* 519.
★Palo Alto Software ... 60 day MBG
6975 Business Plan Toolkit 4.0 ..... 75.
11199 Sales & Market Forecasting Toolkit..... 75.
★Pastel Development ... 30 day MBG
1785 DayMaker 2.01 ..... *limited special* 69.
12052 DayMaker/DoveFax PB 125. 12053 Pro 339.
★Peachtree ... 60 day MBG
9584 Acct. for Mac 119. 9588 Insight Acct. 299.



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LetterWorks, SALES or LEGAL..... *ea.* 45.
SAS Institute
10797 JMP 2.0 and DeltaGraph Pro Bundle .. 599.
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8810 Informed Manager 99. 7692 Designer 149.
10832 Informed Foundation ..... 299.
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3422 More 3.1 ..... 265.
★SYSTAT ... 30 day MBG
1230 FASTAT 2.0 399. 1231 SYSTAT 699.
★TechWorks ... 30 day MBG
7736 Spiral 1.0 ..... 72.
★Teleware ... 30 day MBG
7616 M.Y.O.B. 3.0 109. 10726 BESTBOOKS 55.
★TIMESLIPS ... 30 day MBG
1701 LapTrack.. 52. 2986 Timeslips III .. 194.
★Vertical Solutions ... 60 day MBG
5886 FastLabel.. 55. 3235 MacLabelPak.. 85.
★WordPerfect ... 60 day MBG
3800 WordPerfect 2.1.3 295. 4711 Upgrd. 75.
10773 WP Works 1.2 *special* 119. 11720 Bundle 149.
★WordStar ... 30 day MBG
6984 Correct Grammar 48. 10277 Correct Bun. 99.
7664 WriteNow Workshop Bundle ..... 42.

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12082 Images with Impact: Places & Faces .... 63.
★Abracadata, Ltd. ... 30 day MBG
9990 Design Your Own Home - Architecture, 9992 Interiors or 9994 Landscape... *ea.* 48.
12083 Design Your Own Railroad ..... 39.
Adobe Systems
Acrobat *(Personal & Network Versions)* call
10167 Adobe Dimensions 93. 5001 Streamline 119.
10289 SuperATM ..... 89. 10423 Upgrade.. 49.
6053 Plus Pack 2.0 ... 118. 6098 TypeAlign.. 61.
4145 Adobe Premiere 429. 3199 Upgrade.. 149.
11843 Illustrator 5.0 368. 6644 Photoshop 548.
AGFA
7971 AgfaType CD-ROM ..... 69.
★Aldus ... 30 day MBG
6674 Personal Press 99. 2461 Gallery Effects 128.
10176 Fetch..... 199. 7541 IntelliDraw..... 194.
3506 SuperPaint.. 99. 4751 Persuasion ..... 325.
1330 FreeHand 394. 11548 PageMaker 5.0 579.
Altsys
1983 EPS Exchange 89. 1195 Fontographer 258.
★Apple Computer ... 30 day MBG
3008 Apple Font Pack ..... 74.
★Ares Software ... 30 day MBG
8878 FontMonger 1.5.7 ..... 93.
Broderbund Software
3572 Kid Pix 1.2.. 34. 7293 Companion..... 23.
1427 Print Shop... 35. 6281 TypeStyler 2.1 126.

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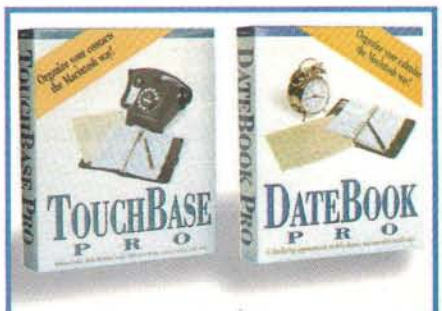
11794 *MicroProbe ADB*—Quickly tests Mac's ADB as well as other vital components.... **69.**

★Claris ... 30 day MBG
2518 MacDraw Pro 275. 8007 Claris CAD 599.
★Claris Clear Choice ... 30 day MBG
11203 Brushstrokes 95. 11473 Comp. Upgrd. 75.
★DeltaPoint ... 60 day MBG
11580 Special: 1-2-3 Mac & DeltaGraph Pro Bun. 99.
★Deneba Software ... 30 day MBG
11055 artWORKS 99. 3227 Canvas 3.0.6 259.
Ergonomic
12316 Panoramix CD Volume 2 ..... 92.
★Expert Software ... 30 day MBG
4870 Expert Color Paint, 1737 Landscape, 8619 Home, or 1731 Office Design *ea.* 29.
Fractal Design
1068 Sketcher 1.0 93. 10402 Painter 2.0 265.
Gold Disk
12276 Animation Works 115. 12279 Astound 95.
Graphsoft
11723 BluePrint... 199. 11724 MiniCad +.. 589.
Gryphon
4202 Morph 1.1 ..... 89.



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12270 Photo CD.. 29. 12265 ColorSense . 329.
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Letraset FonTek Library - Full line avail. call
4709 LetraStudio.. 139. 6300 FontStudio.. 299.
Light Source
11059 Ofoto 2.0 ..... 275.
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2569 Cyrillic II.. 99. 2641 Laser Hebrew ... 89.
Macromedia
7651 Action! Mac 349. 7441 SwivelPro ... 479.
3450 SwivelMan. 596. 7653 MacroModel 999.
★ **Manhattan Graphics ... 30 day MBG**
4990 Ready,Set,Go! 6.0 ..... 219.
★ **Microsoft ... 30 day MBG**
2878 PowerPoint 3.0 295. 10065 Upgrade 125.
2565 Project 3.0..... 445. Upgrades ..... call
Postcraft International
2210 Effects Specialist 2.0 ..... 89.
Quark
7612 QuarkXPress 3.1 ..... 549.
Queue, Inc.
11185 Toucan Press ..... 49.
★ **Specular International ... 30 day MBG**
4962 Infini-D 2.5 ..... 699.
★ **Strata ... 30 day MBG**
7773 StrataVision 3D 2.6 ..... 599.
★ **Synergy Software ... 30 day MBG**
6617 KaleidaGraph 3.0 ..... 149.

★**Golden Triangle ... 30 day MBG**
11731 *TimesTwo (1.44)*—Double your disk space without compressing files! It automatically expands your disk up to twice its original size, leaving all of your data unchanged **$95.**
11773 *TimesTwo (800K)* ..... **95.**

★ **Timeworks ... 30 day MBG**
7115 Publish It! Easy ..... $109.
★ **T/Maker ... 30 day MBG**
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★ **Virtus Corporation ... 30 day MBG**
4488 WalkThrough 1.1.3 ..... 309.

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★ **Abbott Systems ... 30 day MBG**
2515 Calc+ 1.0.. 36. 5236 CanOpener 2.0 59.
11735 FindAll 1.0 ..... 36.
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7410 StuffIt SpaceSaver 34. 6740 Deluxe 65.
★ **ALSoft ... 30 day MBG**
9808 MasterJuggler 25. 9807 DiskExpress II 45.
★ **Apple Computer ... 30 day MBG**
1206 At Ease 44. 7072 QuickTime Starter Kit 105.
1074 System 7.1... 79. 3413 MultiPack.... 369.
★ **Atticus Software ... 60 day MBG**
9120 Super 7 Utilities ..... 64.
★ **Berkeley Systems ... 30 day MBG**
5737 After Dark 2.0x *(30+ screens)* ..... 28.
2198 More After Dark.. 23. 2196 Bundle.. 39.
3392 Star Trek: The Screen Saver..... 34.
★ **Binary Software ... 30 day MBG**
11989 Square One 1.5 ..... 45.
★ **Casa Blanca Works ... 30 day MBG**
1593 Drive 7 2.3 ..... 49.
★ **CE Software ... 60 day MBG**
1727 CalendarMaker 39. 8024 QuicKeys^2 89.
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10595 Safe & Sound 37. 5041 MacTools 2.0 99.
★ **Claris Clear Choice ... 30 day MBG**
11205 Retrieve It! ..... 60.
★ **Dantz Development ... 30 day MBG**
9115 DiskFit Direct 1.0... 29. 3393 Pro .... 72.
5255 Retrospect.. 147. 7945 Remote 2.0.. 264.
★ **Datawatch ... 30 day MBG**
8562 Complete Undelete ..... 31.
4803 Virex/Mac 62. 11486 SuperSet Utilities 93.
Delta Tao Software
10755 WonderPrint ..... 36.
★ **Fifth Generation ... 30 day MBG**
4287 PYRO! 4.01 27. 3955 Suitcase 2.1.2 53.
7404 DiskDoubler 52. 4838 AutoDoubler ... 58.
12298 AutoDoubler/DiskDoubler Combo ..... 85.
10398 CopyDoubler 39. 7704 Public Utilities .. 98.
FWB, Inc.
2999 Hard Disk ToolKit 125. 7929 Personal 49.
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11193 Kai's Powertools for Photoshop ..... 89.
★ **Inline Design ... 30 day MBG**
1744 Icon 7..... 49. 9843 Inline Sync 1.0.. 79.
7068 INITPicker.. 49. 2913 Redux 1.63 ..... 49.
★ **Kent Marsh Ltd. ... 30 day MBG**
9513 FolderBolt 71. 1839 NightWatch II ..... 89.
10498 FolderBolt/NightWatch II Bundle ..... 129.
★ **Kiwi Software ... 60 day MBG**
11736 Screenscapes ..... 34.
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10272 PowerMerge 1.0 ..... 79.
11717 PowerMerge 1.0/Targus Notepac Bundle 89.
★ **Logical Solutions ... 30 day MBG**
10169 7th Heaven 2.5 67. 11191 Chameleon 39.
★ **MAXA Corporation ... 30 day MBG**
11248 Alert! 115. 10772 Snooper *(software)* 129.
10771 Snooper 2.0 Hardware & Software Kit.. 179.
MBS Technologies
11886 File Runner for Mac 1.0 ..... 75.
★ **Nine to Five Software ... 30 day MBG**
2020 9 to 5 Office.. 19. 9767 Reports 2.5.. 125.
★ **No Hands Software ... 30 day MBG**
11195 Magnet 85. 11194 Common Ground 122.
★ **Now Software ... 30 day MBG**
6925 Now Utilities 4.0.... 84. 8471 *(10)*... 775.

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8210 PLOTTERgeist 2.1 ..... 249.
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10594 Offline 3.82 ..... 62.
Stac Electronics
11568 Stacker for Mac ..... 65.
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9957 THINK Ref 2.0 89. 2688 THINK C 6.0 199.
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5203 Help! ..... 88.
★ **TGS Systems ... 60 day MBG**
6667 Prograph 2.5.2 ..... 299.
★ **Thought I Could ... 30 day MBG**
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UserLand Software
4753 Frontier 2.0 ..... 185.

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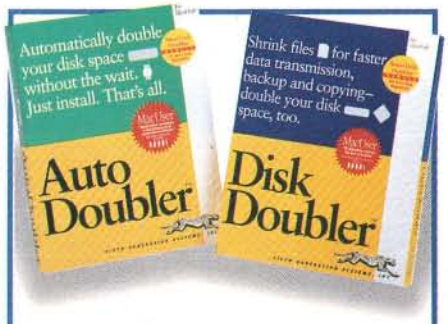
Carmen Sandiego Series *(CP)*..... *ea.* 29.
8285 Where/World Carmen Sandiego Deluxe 47.
11561 TRISTAN Pinball ..... 35.



★**Fifth Generation ... 30 day MBG**
12298 *AutoDoubler/DiskDoubler Combo*—AutoDoubler doubles your disk space by automatically compressing your files. DiskDoubler shrinks files for faster data transmission, backup and copying ..... **$85.**

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11369 Super Mines 29. 11756 Super Maze Wars 39.
11757 Super Maze Wars Network Pack ..... 59.
★ **Carina ... 30 day MBG**
7761 Voyager II, the Dynamic Sky Simulator.. 99.
★ **Centron Software ... 30 day MBG**
11959 WordSearch Creator ..... 30.
5910 Crossword Creator 39. 8524 Casino Master 45.
Changeling Software
11188 Pax Imperia ..... 35.
Colorado Spectrum
2554 Mouse Yoke *(aircraft yoke adapter)* ..... 29.
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10953 Kid Pictures 19. 3922 Talking Spell It + 28.
2574 MathBlaster Plus or 7942 Kid Works 2.. 34.
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2536 Spaceward Ho! or 2439 Strategic Conq. 36.
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7155 Kid Desk 24. 7318 Millie's Math House 29.

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8083 Missions at Leyte Gulf *(req. Hellcats)*.... 20.
4756 Hellcats Over the Pacific 1.0.3 ..... 38.
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10935 Out Of This World..... 34.
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3281 The Writing Center 1.0 ..... 51.
★ **Leister Productions ... 30 day MBG**
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11629 SimCity Supreme Bundle ..... 45.
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3963 Oregon Trail 1.1 ..... 28.
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Pluma, Inc.
8695 Capitalist Pig ..... 34.
Psygnosis
11562 Lemmings..... 35.
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11098 Crosswords... 20. 7396 Red Baron .. 39.
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Velocity
11538 Spectre Supreme 40. 11537 LAN 2-Pak 52.

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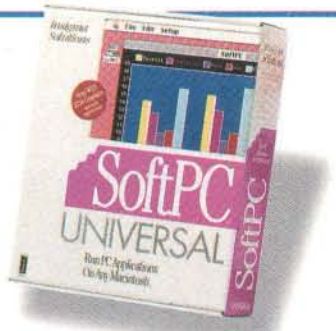
Coda Music Technology
8188 MusicProse 2.1 189. 5604 Finale 549.
Envisio
4106 Quick-16..... 399. 11485 Pressto... 639.



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4089 *Universal SoftPC*—Create an MS-DOS window on any Mac computer. Load MS-DOS programs into your Macintosh—even those that come on a PC CD-ROM—and use them like you would on a basic IBM 286 AT.. **$99.**

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5486 Sound Edit PRO 199. 7651 Action! Mac 349.
4598 MacRecorder Sound System PRO..... 239.
5087 MacroMind Director 799. 2246 3-D 999.
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11738 Pro Audio Spectrum 16 NuBus ..... 329.
NEC
4252 MultiSync 3FGx ..... 689.
Nova Development
11101 Kaboom! 29. 12278 w/More Kaboom! 40.
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Passport Designs
10362 Passport Producer 299. 8250 Encore 379.
Radius
1738 PrecisionColor Pivot *(reqs. interface)*.. 999.
7870 Rocket 33 ..... 1599.
RasterOps
8944 RasterOps 24STV ..... 799.
11258 Editing Aces Suite/Digital Video Solution 3379.

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Software Toolworks
5201 The Miracle *(piano teacher)* ..... 349.
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10530 14" Multiscan Trinitron Monitor..... 689.
10529 17" Multiscan Trinitron Monitor..... 1149.
Sound Source
Star Trek: Original TV Vol. 1 or 2 ... *ea.* 30.
11483 Star Trek: Next Generation Virtual Data 30.
11484 Star Wars 30. 1759 A Space Odyssey 35.
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7676 VideoSpigot Pro or 3691 Pro si ... *ea.* 1039.
9074 Spectrum/24 PDQ+ ..... 1549.
7679 Spigot & Sound.. 489. 7678 Pro... 1129.
7677 17" SuperMatch Multimode ..... 999.
1805 20" SuperMatch Color Display ..... 1549.
4720 21" Platinum Two-Display ..... 1099.
10321 ColorPage T16II ..... 1339.
9066 Futura SX.. 485. 9065 Futura MX ..... 839.

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3730 Just Grandma and Me ..... 34.
9059 Arthur's Teacher Trouble ..... 41.
CD Technology
2321 CD-ROM Caddy $11. 2533 *(5 Pack)* $49.
4084 America Alive! 75. 8057 Porta Drive 619.
Creative Multimedia Corp.
11001 The Complete Works 19. 11004 Audubon 45.
11003 Family Doctor HyperCard Version..... 45.
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1343 Manhole 23. 2717 Cosmic Osmo 1.1 37.
FWB, Inc.
10198 CD Toolkit.. 49. 11582 HammerCD.. 739.
★ **Highlighted Data ... 30 day MBG**
7771 Webster's Dictionary ..... 149.
★ **HyperGlot Software ... 30 day MBG**
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Interplay Productions
7111 Battlechess CD-ROM Enhanced..... 45.
★ **MediaVision ... 60 day MBG**
11570 CD-ROM Multimedia Kit ..... 799.
★ **METATEC/Discovery Sys.. ... 60 day MBG**
9967 Nautilus Mini-Subscription Kit..... 20.
4007 World Almanac & Book of Facts 1993... 50.
★ **Multimedia Library ... 30 day MBG**
IMAGE Series Vol. 1-4, 8 ..... *ea.* 105.
7313 SOUND Series Vol. 1 ..... 105.
NEC
6577 CDR-38 Portable CD-ROM Drive..... 479.
6582 CDR-74-1 CD-ROM Drive ..... 629.
Peripheral Land, Inc. (PLI)
10923 Multi-Session Photo CD-ROM Drive ... 699.
★ **Presto Studios ... 30 day MBG**
11330 The Journeyman Project ..... 56.
Quantum Leap Tech.
11457 Aesopolis ..... 49.
Queue, Inc.
11186 Velveteen Rabbit ..... 29.
11183 Greatest Children's Stories ..... 29.
Software Toolworks
10308 US Atlas 34. 3915 Grolier Encyclopedia 249.
Warner New Media
11008 Desert Storm 27. 11007 Word Tales 39.
11028 Magic Flute 44. 11026 The Orchestra 54.
Wayzata Technology
Font Pro Vol. 1 & 2 ..... *ea.* 59.
11605 CD Fun House 25. 10188 Macnificent 7 35.

COMMUNICATIONS
MODEMS, MAIL, NETWORKS

★ **Apple Computer ... 30 day MBG**
7073 Mac PC Exchg. 59. 7102 AppleShare 969.
7101 AppleTalk Remote Access ..... 149.
★ **Applied Engineering ... 30 day MBG**
11707 QuadraLink... 199. 10361 DMA..... 399.

★**WordPerfect ... 30 day MBG**
11720 *WordPerfect Works Bundle*—Includes word processing, database, spreadsheet, charting, drawing and painting, and communications software, all seamlessly integrated into one powerful program. Get added value when you buy WordPerfect Works along with: Intuit's Quicken 3.0, one of the most widely used personal finance programs on the market; Casady & Greene's QuickDex II, quick reference to names, addresses, phone numbers and more in a rolodex card format; and Inline Design's S.C.OUT, a puzzle/action game where you have to reactivate a moon base that has been invaded by aliens. Four great products at a super price **special $149.**

$5 STAR TREK REBATE!

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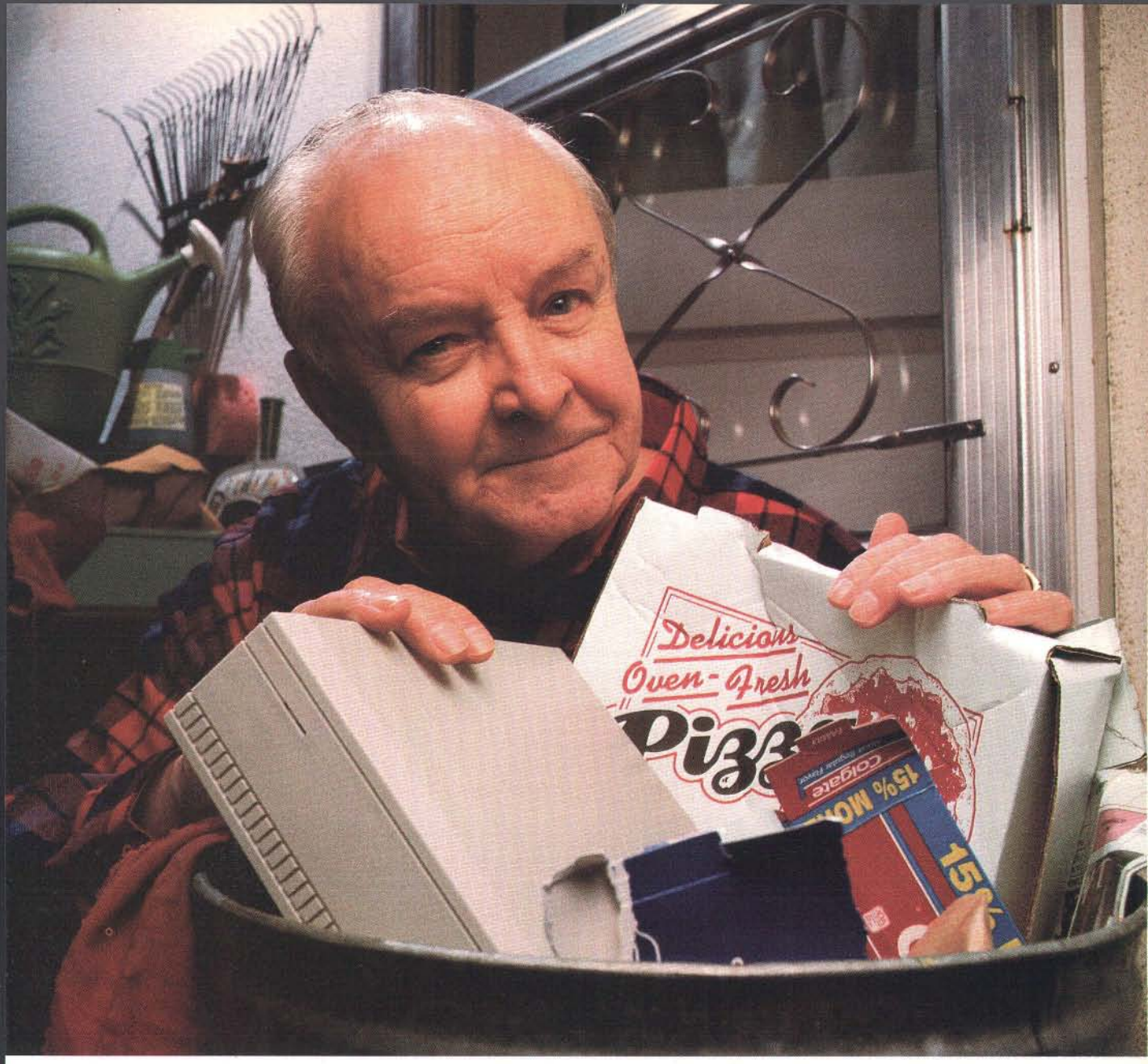
3392 *Star Trek: The Screen Saver*—Beam aboard the Enterprise & prevent screen burn-in—15 screens to select from ..... **$34.**
5737 *After Dark 2.0x (30+ screens!)* ..... **28.**
2196 *After Dark & More After Dark Bundle* **39.**

Asanté Technologies, Inc.
2775 10/T Hub-8 249. 2772 10/T Hub-12 499.
BOCA Research
11052 M144I V.32bis FaxModem ..... 239.
★ **Cardinal Technologies ... 30 day MBG**
7670 MVP24MAC 69. 11621 MVP96MAC 179.
11698 MVP144MAC ..... 239.
★ **CE Software ... 60 day MBG**
8066 QuickMail *(5 user)* 279. 8067 *(10)* 399.
★ **CompuServe ... 60 day MBG**
1676 Mac Membership Kit 2.0.2..... 25.
1673 Navigator 3.2..... 49. 1674 Bundle... 72.
★ **Datawatch ... 30 day MBG**
11490 ScreenLink Twin Pack 2.0.5..... 62.
★ **DataViz ... 60 day MBG**
1823 MacLink Plus/PC ..... 129.
4842 MacLink Plus/Translators ..... 109.
★ **Dayna ... 60 day MBG**
11878 DOS Mounter Plus ..... 54.
12041 Safe Deposit Personal..... 59.
DaynaPORT E: *(BNC or 10 BASE-T) ea.* 149.
8719 EtherPrint or 9888 *(10BASE-T)* ..... *ea.* 339.
11012 EtherPrint 3 379. 11011 EtherPrint 3+ 479.
1962 PathFinder ..... 599.
12047 DaynaSTAR HUB 24 ..... 869.
★ **Dove Computer ... 30 day MBG**
6758 DoveFax 2..... 199. 3352 NuBus.... 199.
9634 DoveFax+V.... 299. 4111 NuBus.... 299.
10199 DoveFax Pro..... 399. 10200 Pro+V ..... 499.
★ **Dow Jones ... 30 day MBG**
5295 Dow Jones News Retrieval Membership 24.
★ **Farallon Computing ... 30 day MBG**
Full line of EtherMac Cards available ... call
4869 PhoneNET Connector 10-Pk *(DIN8)*... 195.
2206 PhoneNET StarController 307..... 879.
4802 Star 357... 899. 4814 Star 377 ..... 1299.
9805 Timbuktu 5.0 or 4866 /Remote 3.0..... 129.
9516 PowerPath.. 105. 9518 LocalPath.. 139.
★ **Freesoft ... 30 day MBG**
6115 White Knight 11 ..... 85.
★ **Global Village ... 30 day MBG**
2175 TelePort/Silver... 319. 2179 Gold ... 369.
Hayes
10822 Accura 2400 ..... 69.
11422 Accura 96 Fax.. 229. 11419 144 Fax 259.
2300 Smartcom II Mac 84. 3226 Upgrade 44.
5971 OPTIMA 24 119. 5970 OPTIMA 96 359.
Insignia Solutions
7557 Access PC.. 59. 3441 SoftNode 2.0.. 89.
4089 Univ. SoftPC. 99. 10553 SoftPC Win .. 299.
11631 SoftPC Pro 3.0/RapidTrak Bundle..... 195.
Logicode Technology
5525 Quicktel Xeba M9624XV ..... 132.
5524 M9696XV... 252. 5523 M1414XV... 265.



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Dear MacConnection,

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Robert A. Lessard
Nashua, New Hampshire

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Just for the record, all the ads in this series feature real live MacConnection customers and the real live letters they wrote. Really!

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12011 PocketHammer 525 ..... $1349.
7570 hammer 80is.. 299. 7579 Int. 120is . 399.
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6499 90 MB Transportable *(reqs. interface)*. 659.
2467 90 MB Gold Std. Rem. Cart. *(Qty. 3)*... 379.
7789 Mac 1B Interface *(w/Central Pt. Backup)* 39.
8781 Mac Transportable 90 PRO ..... 499.
10500 21 MB Floptical Drive ..... 459.
11943 1" Portable 210 MB ..... 529.
10499 Transportable MultiDisk 150 ..... 799.

MASS Microsystems

2973 120 MB HD 449. 2972 210 MB HD 539.
3678 120 MB Port. HD 375. 3663 210 MB 539.
10848 DataPak 88c 649. 11650 DataPak 105 839.
7008 HitchHiker Portable Drive *(120 MB)* .... 649.

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MDS 88 SyQuest w/SW & cartridge *ea.* 499.
MDS 88c SyQuest w/SW & cartridge *ea.* 599.

Peripheral Land, Inc. (PLI)

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8327 PLI Infinity 40 Turbo 479. 9752 88 579.
11470 PLI Infinity 88/RW 44 ..... 699.
2864 PLI Infinity Floptical Drive *(21 MB)* ..... 399.
10926 1 GB Drive.. 1739. 10849 170 MB.. 479.
4645 PLI Infinity MO 3.5" Optical Drive ..... 1449.
2865 Floptical Cart. *(21 MB)* 29. 2899 *(10 pk.)* 259.
10733 520 MB ..... 1349.

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10322 PowerLink Presentor ..... 439.

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7379 3½" HD Disks *(11)*... 13. 2241 *(50)* ..... 58.
4863 3½" HD Disks *(20)* with storage case.... 25.

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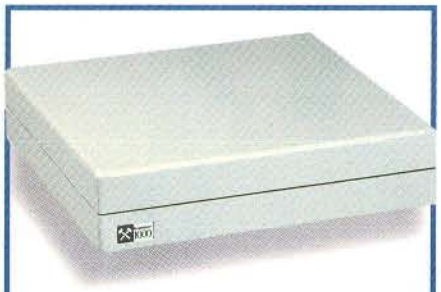
11866 3½" DS Disks *(10)*.... 8. 11865 *(30)*..... 22.
11864 3½" DS Disks *(50)* ..... 32.
11870 3½" HD Disks *(10)*.. 12. 11869 *(30)* .... 35.
11867 3½" HD Disks *(50)* ..... 50.

KOMAG

10439 3½" Optical Media.. 39. 10442 *(5)*... 175.

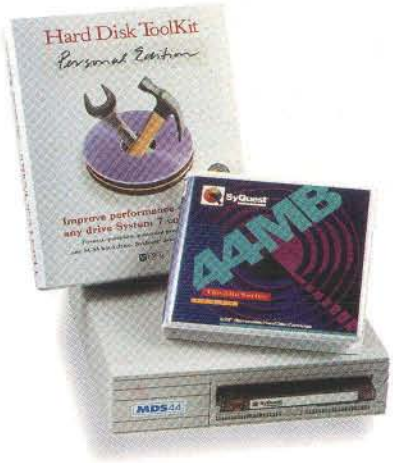
★ Sony ... 60 day MBG

3297 3½" DS Disks *(10)*.... 9. 6148 *(30)*..... 25.
3298 3½" HD Disks *(10)*.. 14. 6375 *(30)* ..... 39.
1603 DG60M..... 15. 2520 DG90M..... 19.
1895 QD2120 19. 11524 3.5" Opt. Media .. 50.



FWB, Inc.

7991 *hammer1000FMF*—1,000 MB high performance hard disk with 9ms average seek. Includes a 2 year warranty and *Hard Disk ToolKit* utility software ..... **$1749.**



★ MDS Drives ... 60 day MBG

All MDS drives come with FWB's *Hard Disk ToolKit Personal Edition* for formatting and customizing partitions.

MDS Removable SyQuest Drives—Come complete with one cartridge.

8141 *MDS 44* ..... **$419.**
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11881 *MDS 120 MB zero footprint* ..... **399.**
11880 *210 MB*.. **499.** 11863 *540 MB* **1149.**
11963 *MDS 120 MB upright* ..... **429.**
11962 *210 MB*.. **539.** 11961 *540 MB* **1199.**

★ SyQuest ... 60 day MBG

5912 44 MB Cartridge *(1)*... 65. 5528 *(5)* .. 310.
3603 88 MB Cartridge *(1)*.. 100. 5530 *(5)* .. 480.
11711 105 MB Cartridge *(1)*.. 79. 11710 *(5)* .. 369.

★SyQuest ... 30 day MBG

Cartridges for SyQuest removable drives.

5912 *44 MB Cart.* . **$65.** 5529 *(3 Pack)*. **$189.**
5528 *(5 Pack)* ..... **310.** 9728 *(10 Pack)*. **615.**
3603 *88 MB Cart.* . **100 .** 5531 *(3 Pack)*... **292.**
5530 *(5 Pack)* ..... **480.** 3600 *(10 Pack)*. **950.**

TEAC

7671 CT600H 60 MB.. 16. 7672 150 MB ... 24.

★ 3M ... 60 day MBG

1581 DC2120..... 22. 11013 *(3 pack)* 60.

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TONERS, CASES, DUST COVERS

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3447 SurgeArrest Plus ..... 39.

★ Apple Computer ... 30 day MBG

9773 StyleWriter Ink Cart. 19. 8499 *(3 Pack)* 55.
7748 Personal LaserWriter Toner Cartridge .. 65.
1115 LaserWriter II Toner Cartridge ..... 85.

★ Avery ... 60 day MBG

5392 Avery 5196 (3½"-*Disk Labels-Laser*)..... 29.

★ Curtis Manufacturing ... 30 day MBG

8973 Apple Security Kit *(SL-2)* ..... 22.

★ DOUBLECASE ... 30 day MBG

10306 DOUBLECASE NB-4400 ..... 129.

★ I/O Design Cases ... 30 day MBG

8812 Ultimate Classic 59. 1941 Ultimate LC 89.

★ Kensington *(full line)* ... 30 day MBG

2559 Apple Security Kit 33. 4973 Pwr. Tree 20 24.

★ Moustrak ... 30 day MBG

Star Trek Mouspads ..... *ea.* 14.

★ Peachpit Press ... 30 day MBG

2267 Mac Bible 4th Edition ..... 24.

★ Targus ... 60 day MBG

7369 Notepac ..... 35.
7370 Business Traveler ..... 199.

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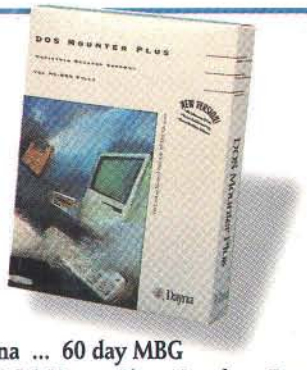
Big glitches & small.



★Dayna ... 60 day MBG
11878 *DOS Mounter Plus*—New from Dayna! Lets you access your MS-DOS files, removable media drives and NetWare servers from your Macintosh desktop for Mac-to-DOS file sharing..... **$54.**

★Synergy ... 30 day MBG
6618 VersaTerm 4.6 $90. 6619 PRO 3.6 $177.
★TechWorks ... 30 day MBG
1582 GraceLAN Network Manager ..... 275.
1584 GraceLAN Network Manager Corporate 669.
Ethernet Cards..... call
Twincom
10335 24/96 Commuter..... 115.
10332 14.4 Pro 259. 10337 14.4 Voyager 325.
U.S. Robotics
11842 Sportster *(14.4)* Mac & Fax ..... 239.
★White Pine Software ... 30 day MBG
2404 Mac 320... 95. 3544 Exodus 4.0... 199.
★Zoom Telephonics ... 30 day MBG
7757 Fax/Modem AFX *(9600S/4800R)*..... 74.
10737 Fax/Modem PBK *(PowerBook)* ..... 92.
3576 FX9624V Send/receive V.42 Fax/Modem 119.
2311 V.32 Modem.. 199. 4698 V.32bis.. 229.
3553 Fax/Modem VFX V.32bis ..... 229.
7917 Pocket FaxModem ..... 99.

★Kensington ... 30 day MBG
2547 *Turbo Mouse 4.0 ADB*—1992 *MacUser*'s Editors' Choice Award Finalist for *Best Input Device*. Advances in trackball technology—including the Brilliant Cursor command—give you smoother, superior cursor control **$107.**

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8123 cc:Mail Remote Mac 2.0..... 199.
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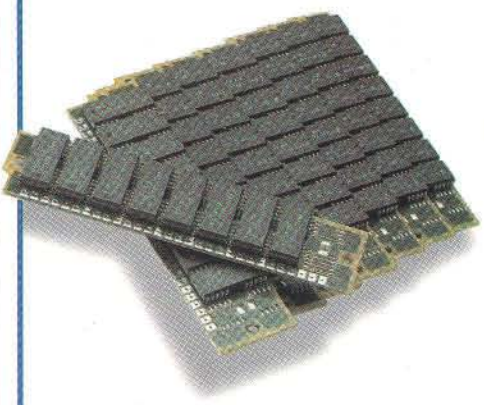
11044 PM9600FX MT FaxModem ..... 209.
11045 PM14400FX MT FaxModem ..... 229.
11046 PM14400FX Pocket FaxModem ..... 389.
8063 PM14400FX FaxModem ..... 419.
★Prometheus ... 30 day MBG
4724 Home Office.... 185. 8990 Ultima .... 375.
★PSI Integration, Inc. ... 30 day MBG
3143 COMstation ONE.. 139. 3142 TWO 239.
5340 COMstation FOUR 359. 6965 FIVE 429.
★Shiva ... 30 day MBG
LANRover/4E for ARA or Netware *ea.* 1699.
LANRover/8E for ARA or Netware *ea.* 2549.
3444 NetSerial 1.35 275. 6555 LanRover/L 599.
4347 NetBridge ..... 599. 4942 TeleBridge 599.
NetModem/E *(thick, thin, 10BASE-T) ea.* 1479.
★Software Ventures ... 30 day MBG
1964 MicroPhone II... 139. 3455 Pro..... 209.
Sonic Systems, Inc.
7572 LaserBridge 135. 7573 SuperBridge 169.
★Sophisticated Circuits ... 30 day MBG
10172 Desktop Dialer..... 47.
★STF Technologies ... 30 day MBG
7644 FaxManager Plus... 74. 7638 LC..... 25.
Supra
11223 SupraFAXModem V.32bis 14400..... 285.
11245 SupraFAXModem V.32bis PowerBook 279.

Advanced Gravis
9963 Mouse Stick II..... 69.
★Apple Computer ... 30 day MBG
11343 ADB Mouse II ..... 79.
★Appoint ... 30 day MBG
2769 MousePen Pro 65. 10415 Gulliver ADB 65.
Caere
4476 OmniPage... 459. 7705 Direct.... 259.
4930 OmniPage Professional..... 649.
Canon Computer Systems
10105 BJ200 *(with GDT PowerPrint)* ..... 429.
★CoStar ... 30 day MBG
1885 Stingray ADB..... 79.
1884 LabelWriter II.. 185. 1880 Plus.... 239.
★Curtis Manufacturing ... 30 day MBG
8046 MVP Mouse *(MVP-1)* ..... 89.
★Datadesk ... 30 day MBG
9830 MAC101E 129. 2384 w/QuicKeys 159.
Dataproducts
10318 LZR 960.. 1699. 10319 LZR 965.. 2099.
Epson
11480 Epsontalk to LQ Printer..... 199.
3052 Mac Interface Kit for ES-600C or ES-800C 325.
11308 ES-600C SCSI Color Scan. *(req. int. kit)* 899.
10741 ES-800C Scanner ..... 1199.
★GDT Softworks ... 30 day MBG
2499 PowerPrint 99. 10171 PowerPrint LT 275.
Hewlett-Packard
2964 DeskWriter C 599. 8368 LaserJet 4 2249.

★Kensington ... 30 day MBG
2547 Turbo Mouse 4.0 ADB..... 107.
Key Tronics
6974 Mac Pro + Kybrd. 139. 1070 TrakPro 219.
KOSS
5460 HD/1 Speakers ..... 19.
11323 HD/4 with Equalizer & AC Adapter..... 55.
11700 HD/6 with Equalizer & AC Adapter..... 79.
Kraft
7519 KM30 Joystick ..... 42.
★Logitech ... 30 day MBG
1671 MouseMan... 77. 1672 TrackMan..... 55.
★MicroSpeed ... 30 day MBG
6621 MacTRAC ADB 2.0 *(SE & II family)* ..... 75.
★Microtek Labs, Inc. ... 30 day MBG
5438 ScanMaker II 899. 11802 II w/Ofoto 2 1049.
5441 IIxe.... 1199. 11801 IIxe w/Ofoto 2 1329.
Monster Design Group
1486 MacSpeakers *(two, stereo)* ..... 169.
★Mouse Systems ... 30 day MBG
7520 Little Mouse ADB or 8001 Plus ..... *ea.* 68.
9471 A^3 Mouse..... 74.
NEC
5377 SilentWriter Model 95..... 1439.
★Pacific Data ... 60 day MBG
7958 LaserJet IV 2 MB 109. 7965 *(4 Pack)*. 399.
7959 LaserJet IV 4 MB 165. 7966 *(4 Pack)* 599.
★Sophisticated Circuits ... 30 day MBG
8009 PowerKey 2.01. 75. 8008 Remote ..... 32.
Thunderware
4994 LightningScan 400 319. 3107 Pro 256 489.
WACOM
11259 The Artz *(6" x 8" Graphics Tablet)*..... 325.



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We carry memory for the various Macs, PowerBooks, Quadras, Performas, and Centris models. All SIMMs come with a full 2-year warranty, plus a free installation manual and video. In recent months, memory prices have varied significantly. Please call for the latest prices and availability.

8316 *1 MB SIMMs (80ns, set of 2)*..... **$89.**
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9437 *2 MB SIMMs (80ns)*..... **79.**
7437 *4 MB SIMMs (80ns)*..... **159.**
7600 *4 MB SIMMs (80ns, set of 4)*..... **599.**
11151 *72-pin SIMMs (70ns, 4 MB)* ..... **159.**
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PowerBook Modules..... **call**

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10283 LC *(33 MHz)* 425. 10282 *(40 MHz)* 372.
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Does not include optional math chip.
8556 FastCache IIci 223. 10933 Charger 869.
1613 FastCache 040 *(Quadra 700 or 900)* .. 279.
11987 FastCache 040 *(Quadra 700, 800, 900, 950)* 409.
PowerCache for SE/30, II, IIx, IIcx, IIci, IIsi, LC
40 MHz ..... 589. 50 MHz..... 769.
Envisio
11542 SmartSource Powerbase *(125 watt)* ... 159.
FWB, Inc.
7567 PocketHammer 80 449. 7566 PH 120 559.
9529 PocketHammer 170 599. 2314 PH 240 739.

INTEGRATED SOFTWARE

ClarisWorks 2.0

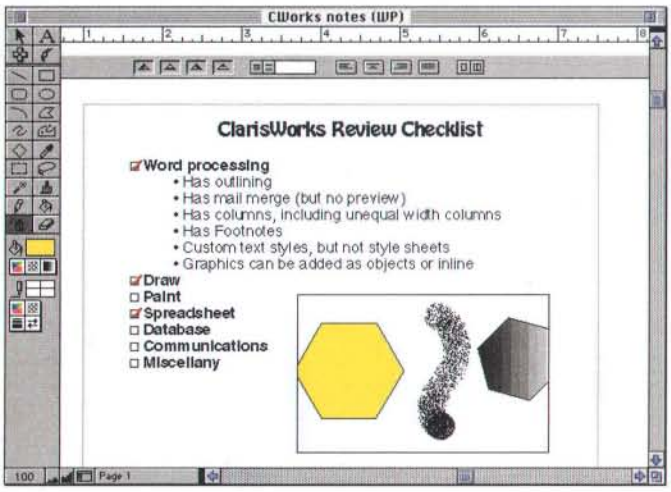
ClarisWorks 2.0 becomes the last word in integrated software.

Not one to rest on its laurels, Claris has released version 2.0 of its acclaimed integrated-software program. For an encore, the company delivered a jack-of-all-trades program that can easily substitute for as many as nine separate stand-alone applications — if, that is, you don't require a power user's feature set.

ClarisWorks 2.0
Published by: Claris Corp., 5201 Patrick Henry Drive, Santa Clara, CA 95052; 408-727-8227.
List Price: $299.

The New Lineup

For starters, ClarisWorks 2.0 boasts a new paint environment. With all its bells and whistles, it easily competes with most entry-level and midrange stand-alone paint programs. Beyond all the expected basics, the environment offers a magic-wand tool; an eyedropper; a polygon tool; and an assortment of special-effects tools, including sheer, distort, pickup, tint, and perspective. The program also supports 24-bit color and resolutions as high as 360 dpi.



An outliner and a paint environment expand ClarisWorks' already impressive feature set. Here, a paint frame is incorporated into an outline in a word-processing document.

A second major addition is an outliner, included as part of the ClarisWorks word-processing environment. To use it, you simply select Outline View from the Outline menu. With a built-in selection of six outline formats (Harvard, legal, bulleted, and more) and a dozen outline labels (including a check-box label that's great for checking completed items on to-do lists), the ClarisWorks outliner actually surpasses that of Microsoft Word.

Now Presenting

Version 2.0 adds business presentation features to the ClarisWorks bag of tricks. The new Slide Show command lets you present each page of a document as an on-screen slide. Options for fades and automatic looping are icing on cake. You can even incorporate QuickTime movies into slides. Although the Slide Show features work within any environment, they're best when used within the draw environment, in which you can set up a master page that includes all the elements that are shared by all the slides.

Claris has also beefed up ClarisWorks' page-layout capabilities, which now offer stiff competition to those of low-end programs such as Personal Press. Noteworthy is ClarisWorks' new Text Wrap option, which allows text to automatically flow around graphics (even irregular ones) and frames. This option, together with the package's linked-text-frames capability — which allows text overflow from one text frame to automatically jump to the next linked frame — lets you create newspaper-style layouts with surprising ease.

ClarisWorks 2.0 also lets you create template-style stationery documents containing data, formatting, and settings — a feature that comes in handy when you have customized a document and want to reuse the settings.

Take a Shortcut

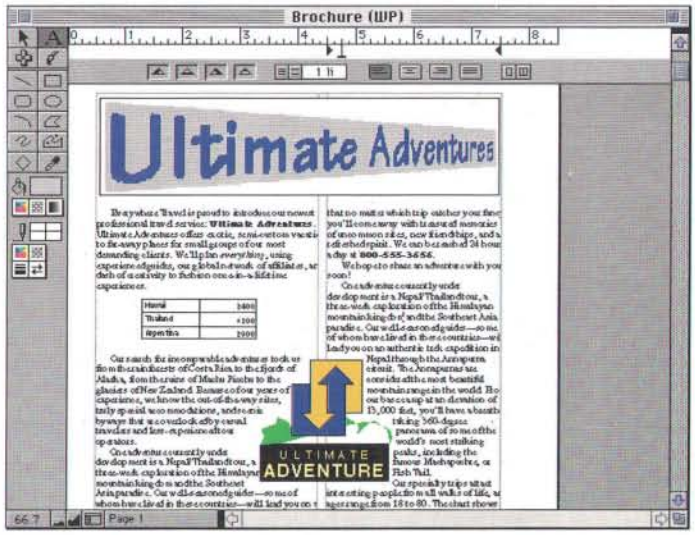
No matter what ClarisWorks environment you're working in, you'll appreciate the new Shortcuts palette, a collection of buttons that trigger macro sequences. ClarisWorks ships with dozens of prerecorded macros.

The best in the collection are so clever at automating operations that they feel like entirely new features. For example, one button serves as the auto-sum tool in the spreadsheet environment. Another automatically formats tabbed text to create a table in a spreadsheet frame. Within the database environment, handy Match Record buttons provide options for selecting records with field values equal to, not equal to, less than, or greater than the value of the current field.

If ClarisWorks' built-in collection of shortcuts doesn't meet your needs, you can create your own. Moreover, you can make shortcuts environment- or document-specific, so they appear only when you can actually use them.

These major new features alone justify ClarisWorks' $99 upgrade cost. In addition, the company has made significant enhancements to virtually every aspect of the program. For example, the word-processing environment now supports columns, even of variable width. The spreadsheet environment supports text wrap within cell borders. New charting functions include combination charts and pictographs. The ClarisWorks database environment provides new options for automatic data entry in new records

as well as for data verification. Another nice touch are the pop-up menus that let users select data from a predefined set of choices. The communications environment provides a phone book in which you can save often-used numbers. New graphics features include a Bézier tool, editable gradient fills, and support for 256 color palettes.



Version 2.0 boosts ClarisWorks' page-layout capabilities. The new release supports columns, including those of uneven widths. In addition, text can wrap around irregularly shaped graphics.

Frame-Based Integration

Version 2.0 enhancements aside, a major ClarisWorks strength has always been its frame-based method of integration. This approach eliminates the hassle of moving among different environments and documents. You can, for example, create a spreadsheet frame from within a word-processing document (or vice versa). More than any other feature, this seamless integration sets ClarisWorks apart from the competition. Moreover, the ability to work with text, graphics, and worksheets within a single document offers advantages that even high-end applications can't always match.

One limitation of frames is that you can't link them to data contained in other documents. For example, if you're working in a word-processing document and create a spreadsheet frame, you can't link that frame to a separate spreadsheet file. However, ClarisWorks 2.0's publish-and-subscribe support partially overcomes this limitation.

PowerBook users and anyone else looking to pack a lot of functionality into a small amount of disk space will be pleased to learn that ClarisWorks 2.0 is as small and speedy as its predecessor. The application requires only 603K of disk space and operates comfortably with less than 1 megabyte of RAM.

Wish List

ClarisWorks 2.0 comes as close to perfection as any application we've seen. However, there are several items on our wish list for the next upgrade. We would like to see the additior of a preview function for viewing mail-merge and database-label output before printing. In addition, to assist in the process of creating page layouts, it would be nice if ClarisWorks marked the location of empty text frames rather than having them disappear when you deselect them. We'd also like to see the Save command support more graphics formats — as it is now, you can save only in PICT format. In the same vein, considering how similar the ClarisWorks database environment is to that of Claris' FileMaker Pro, it's disappointing that ClarisWorks still can't directly open FileMaker Pro documents. Last, we'd especially like the word processor's Custom Styles to be replaced by true style sheets, such as those in all major stand-alone word processors. These features could all be added to the program without compromising the simplicity and consistency that makes ClarisWorks so appealing.

Bottom Line

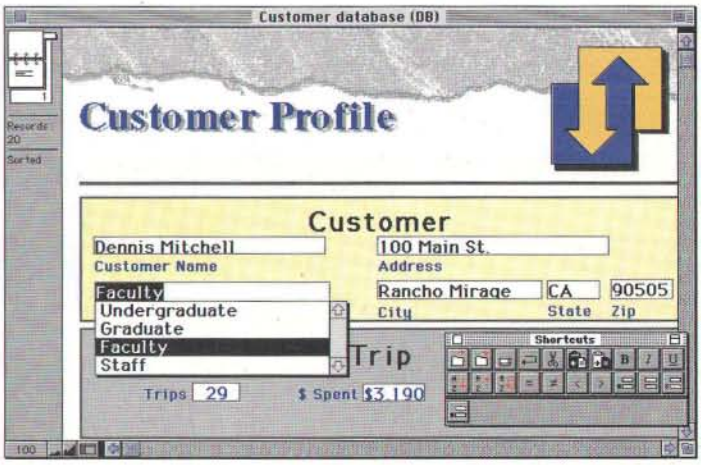
ClarisWorks 2.0 is the clear leader in the integrated-software arena. And with the addition of an outliner and a paint environment, the package matches Symantec's GreatWorks integrated-software package feature for feature.

Moreover, the original version of ClarisWorks was clearly superior to both Microsoft Works and WordPerfect Works (formerly BeagleWorks); the new version widens the gap.

Beyond the integrated-software arena, ClarisWorks' newly enhanced functionality allows it to challenge an assortment of low-end stand-alone graphics and page-layout programs — especially when you consider the cost savings of purchasing ClarisWorks over two or three separate applications.

If you already own ClarisWorks 1.0, the upgrade is well worth the price. If you're a new Mac owner, ClarisWorks is likely to be the only software you'll need for a long time to come. We believe that few other programs showcase the Mac's strengths as well as ClarisWorks does. Even experienced users are likely to find that ClarisWorks not only meets their needs but even exceeds them.

— Ted Landau



The new ClarisWorks is even easier to use than its predecessor. Pop-up menus speed data entry in the database environment. The new customizable Shortcuts palette (lower right) lets you activate multiple tasks with a single button.

DRAWING

CA-Cricket Draw III 2.0

The new Cricket Draw III draws a shaky bead on FreeHand and Illustrator.

With the latest release of its affordable $249 PostScript draw program, Computer Associates adds professional-level tools to Cricket Draw III. Highlights of version 2.0 are a new Tweening command, editable type outlines, improved type-on-a-curve features, and support for color separations. From a high-end perspective, these enhancements fill many of version 1.0's gaps. However, several glaring omissions prevent the new Cricket Draw III from standing shoulder to shoulder with powerhouses Adobe Illustrator and Aldus FreeHand.

Cricket Draw III 2.0
Published by: Computer Associates, One Computer Associates Plaza, Islandia, NY 11788; 516-342-5224.
List Price: $249.

Under Extrusion

Several of Cricket Draw III's new tools boost the program's special-effects capabilities. The extrude tool adds depth to objects or paths, making them appear to be three-dimensional. This feature produces especially cool effects when you use it with gradient-filled objects; unfortunately, you can't use it with objects that contain holes. The extrude tool is not a true 3-D tool, however, so you shouldn't expect the kinds of results you can achieve with the extrusion tools in Adobe Dimensions or RayDream's AddDepth.

The bound-text tool, for binding text to a curve, now works much like its counterpart in Illustrator. When you click on a location on a path, an insertion point appears and you can begin entering text directly on the path. Once you've created a bound-text object, you can edit and manipulate it, again directly on the path. Editing features include the ability to change font, size, style, color, and justification as well as support for superscripting, subscripting, and manual and automatic kerning.

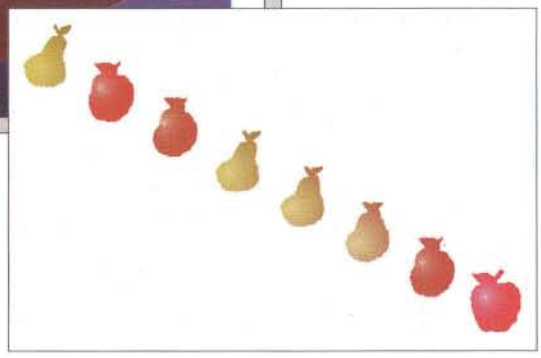
Cricket Draw III gives you lots of flexibility for controlling how text is positioned on any given path. The alignment options include baseline, ascender, and descender. Thankfully, the editing mode is now WYSIWYG, so you can see what the bound-text object looks like as you change its attributes — a useful standard feature in high-end PostScript drawing programs.

Version 2.0's newly added support for converting text to outlines (Bézier paths) further strengthens Cricket Draw III's arsenal of type tools. In addition to working with TrueType and PostScript Type 1 fonts, this feature allows you to convert bit maps to outlines — a capability unique to Cricket Draw III. TrueType fonts and bit maps appear somewhat blocky after you've converted them, but PostScript font outlines are as good-looking as those produced by Illustrator or FreeHand. The addition of editable outlines to version 2.0 means that you can now apply Cricket Draw III's excellent gradients to text.

Everything in Be-Tween

Another special-effects feature that makes the new Cricket Draw III more competitive with FreeHand and Illustrator is the Tweening command, which blends one selected object or path into another. When tweening, you specify the number of intermediate objects the program creates as it transforms the start object into the end object. What's special about Cricket Draw III's implementation is that it allows you to create custom steps for controlling the blending process; you manipulate a curve that controls the attributes of intermediate objects as well as how quickly objects transform. This is a more complex and powerful method of blending shapes than are the simple percentage settings provided by Illustrator or FreeHand; you'll need some practice before you can fully exploit the program's capabilities in this area.

Cricket Draw III also scores well in the area of System 7 support. The program is 32-bit clean and supports Balloon Help and publish-and-subscribe.



Cricket Draw III 2.0 gains new features for creating special effects. The extrude tool, when used on gradient-filled text, lets you produce type with a distinctive 3-D look (left). The new Tweening command blends one object into another (right).

Balloon Help is thorough — it's available for all menu commands and toolbox icons. The company supplements Balloon Help with a separate on-line help system that further explains Cricket Draw III's menu commands and capabilities.

For the Pros

To satisfy professional users, Cricket Draw III now provides color-separation support. You can prepare film separations — both process and spot — directly from within the program. Controls let you automatically generate crop and registration marks, and you can opt for positive or negative film, with emulsions up or down.

The program also lets you select a global color model (HLS, RGB, CMYK, or gray) for a document from within the Color window. Cricket Draw III is flexible here too: You can use the window's Apply button to change the model for one or more selected objects in a document.

Cricket Draw III includes PPDs (PostScript Printer Descriptions) for most popular printers and image setters. PPDs provide the default line screen and dot angle for the selected printer, but you can override these specifications for each ink.

In addition, the Ink Setup Options dialog box gives you direct control over which inks print or overprint. You can even specify overprinting for lines, fills, fountains, shadows, and text colors of selected objects. The Document Setup dialog box lets you set custom page sizes as large as 100 x 100 inches. You can also opt for automatic tiling and document scaling. Commands in the Layout menu let you set cut, fold, and crop marks.

Cricket Draw III's revised documentation is a big improvement over the previous version's. The manual, which includes clear and concise illustrations, offers numerous step-by-step examples that show how the program's tools work. It also has an excellent section on working with service bureaus and how to properly trap objects when your final output device is a printing press.

Finally, Cricket Draw III includes a spelling dictionary and a thesaurus that are on a par with those in most of today's word-processing programs.

What's Missing

Cricket Draw III's wealth of useful tools and professional-level capabilities aside, the program still falls short of Illustrator and FreeHand. Specifically, several shortcomings that plagued the original version have remained uncorrected and several key professional tools are missing.

You can modify imported EPS files by rotating, skewing, reflecting, and scaling, just as you can any object in Cricket Draw III, but you still can't edit them (you can't edit EPS files exported from Cricket Draw III to other programs either). This is a real liability, especially for those who frequently import EPS clip art and edit it. Moreover, the program lacks support for drawing layers — a serious omission. Every other major draw program now includes support for layers.

Professionals will also miss custom guides and object-point snapping. Although Cricket Draw III provides grid and guide snapping, you can't snap one Bézier control point to another. This makes creating complex objects difficult and time-consuming. Cricket Draw III also lacks support for patterns and tiles.

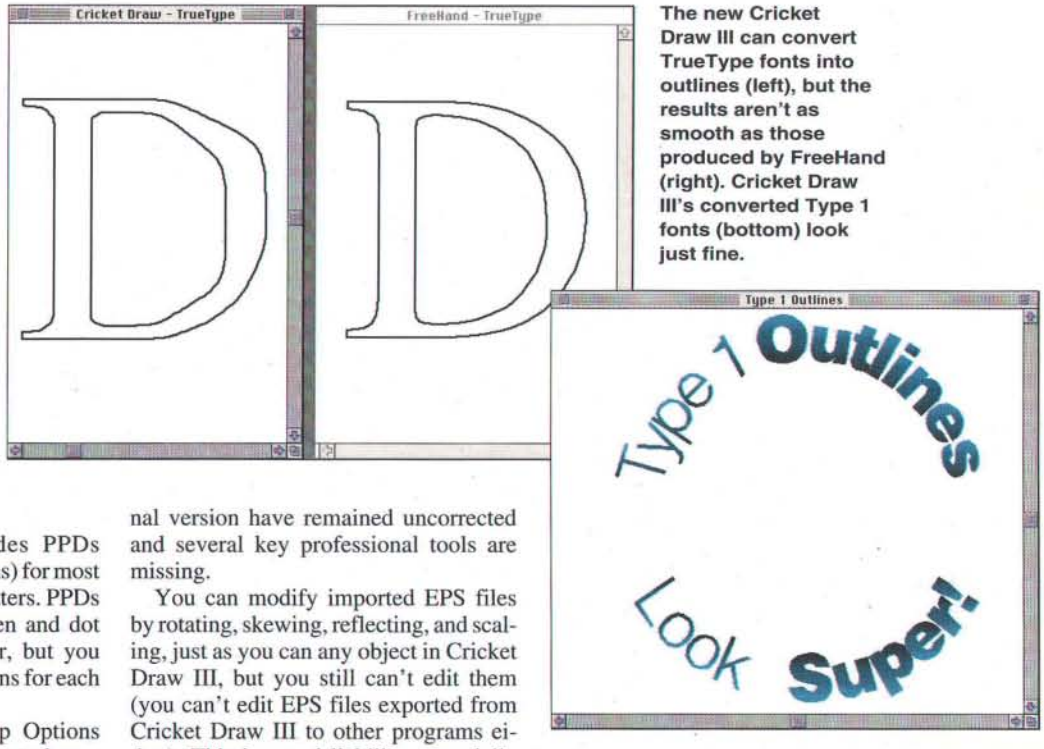
Our final gripe has to do with Cricket Draw III's type outlines. The program doesn't automatically cut holes in outlines created from text blocks. Furthermore, when you re-create a hole, such as the one in the letter *A*, Cricket Draw III doesn't retain the stroke information related to the hole, which makes it difficult to trap letter forms and other compound objects.

The Bottom Line

For those who are looking for a PostScript draw program that's versatile and easy on the budget, Cricket Draw III 2.0 is a solid value. At $249, it saves you more than $300 over the cost of a high-end draw program such as Adobe Illustrator. Moreover, new features such as the extrude tool, tweening, editable type outlines, System 7 savviness, and support for color separations move Cricket Draw III several notches closer to competing successfully with the more expensive high-end draw programs. For current users of version 1.0 of Cricket Draw III, the new release is well worth the $69 upgrade cost.

However, the program remains sorely lacking in some key areas. The lack of support for multiple drawing layers and the weak handling of standard EPS files seriously detract from Cricket Draw III's otherwise compelling feature set. Both omissions are likely to steer serious graphics users elsewhere.

— Sean Safreed



The new Cricket Draw III can convert TrueType fonts into outlines (left), but the results aren't as smooth as those produced by FreeHand (right). Cricket Draw III's converted Type 1 fonts (bottom) look just fine.

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*AppleShare administration averages $10,000 per year less than other systems, according to the Business Research Group (BRG) study "Lifecycle Costing for PC LAN Administration — A Comparative Analysis of 5 Leading NOS Environments." Environments compared were AppleShare, Banyan VINES, Novell Netwar
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Built-in network support. *With Ethernet, LocalTalk,® TCP/IP and AppleTalk® software built in, the Workgroup Server 95 fits into just about every office environment with a minimum of effort.*

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Database power. *The Workgroup Server 95 has the power to drive the ORACLE7 relational database, supporting MS-DOS, Windows, Macintosh, OS/2 and UNIX clients. It also provides enhanced performance for 4D Server from ACI.*

Now serving Windows. *New software from Apple and Farallon lets MS-DOS and Windows users connect easily to the Workgroup Server 95 and Apple printers.*

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OUTPUT DEVICES

Apple Color Printer and Apple Color OneScanner

Apple aims high but scores low with its color publishing system.

Apple Computer has accompanied the introduction of its line of inexpensive color Macs with forays into the world of color publishing peripherals. The company is touting its new Apple Color Printer and Apple Color OneScanner as key components of a complete low-cost color publishing system suitable for professional prepress work as well as for less demanding tasks such as creating business presentations. However, with the exception of the software that's bundled with the scanner, we found both products to be fairly unimpressive. Each is capable enough for general office applications, but users with more-demanding color-publishing needs will do well to look elsewhere.

Apple Color OneScanner
Manufactured by: Apple Computer, 20525 Mariani Avenue, Cupertino, CA 95014; 408-996-1010.
List Price: $1,349.

Apple Color Printer
Manufactured by: Apple Computer, 20525 Mariani Avenue, Cupertino, CA 95014; 408-996-1010.
List Price: $2,349.

Apple Color Printer

The $2,349 Apple Color Printer is a 360-dpi inkjet printer that connects to your Mac with a 50-pin SCSI cable (which costs extra). As you would expect with an Apple device, setup is a breeze. After the installer has loaded the software, you connect the printer to your Mac (the printer requires that your Mac be equipped with at least 4 megabytes of RAM and be running under System 7.0 or later) and then select it in the Chooser.

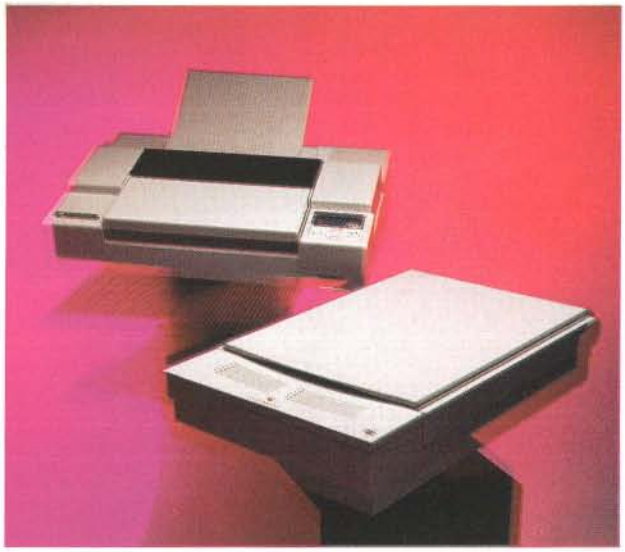
Compared with that of many other color inkjet printers on the market, the Color Printer's built-in network and printer-language-emulation support is a disappointment. Although the Color Printer can be shared with other Macs on an AppleTalk network, with Apple's GrayShare technology (in the same fashion as Apple's new StyleWriter II), we found that this sharing scheme can seriously degrade the performance of the host Mac. Moreover, the printer doesn't support PCL 5, HP-GL-plotter, or PostScript emulation.

The Color Printer's connection ports come in two flavors — SCSI (for connecting to Macs) and 36-pin parallel (for non-Mac computers) — but you can use only one port at a time.

The printer's automatic sheet feeder is conveniently integrated into the top of the printer. It holds as many as 100 sheets of 20-pound stock or 5 envelopes. Although you can use ordinary bond stock, we recommend coated paper if you want to minimize the bleeding and smearing that's common with inkjet-printer output. The Color Printer can produce transparencies, but its sheet feeder can handle only one transparency sheet at a time.

Four ink cartridges (cyan, magenta, yellow, and black) slide into and out of the front of the printer. Each cartridge is good for approximately 400 pages. Replacements for the black cartridge cost $25 each, and replacements for the others are a pricey $35 each. The printer's control-panel display alerts you when a cartridge is empty. The panel also has controls for printing test pages, cleaning ink nozzles, and changing the SCSI ID as well as for functions and printing modes specific to non-Mac computers.

Based on the same Canon engine as the Lexmark IBM Color Jetprinter PS 4079 (see review, April '93, page 56), the Color Printer bears a strong physical resemblance to the Lexmark unit (except for the Apple logo on its case, which appears in black-and-white — an odd divergence from the traditional color logo and especially odd on a color output device). Not surprisingly, it also shares the Jetprinter's mediocre performance and output quality. The Color Printer lists for about $1,500 less than the Jetprinter, but it lacks the Jetprinter's emulation features and support for various network standards.



The Apple Color Printer (left) and the Apple Color OneScanner (right) add up to an affordable but somewhat lackluster color system suitable for general office uses such as creating business presentations.

Apple Color OneScanner

The $1,349 Apple Color OneScanner is a flatbed device that captures 24-bit color in a single pass. It can scan color images at resolutions ranging from 72 to 1,200 dpi. Setup is easy — the package comes with everything you need in order to get started, including the excellent Ofoto 2.0 color-scanner software. The real beauty of Ofoto is its ability to automate the scanning process — it effectively shields inexperienced users from many of the confusing and arcane controls associated with color image scanning. You can also use Ofoto's calibration feature to fine-tune images for your specific printer so (ideally) output closely matches the scanned image. Light Source, Ofoto's maker, offers the software as a stand-alone $395 package, so owners of scanners other than Apple's offering can take advantage of its considerable talents. To further ensure color matching from scanned input to printed output, both the Color OneScanner and the Color Printer support Apple's ColorSync architecture.

These images were scanned with the Apple Color OneScanner and printed with the Apple Color Printer. The greenish tinge in the right image is characteristic of Color OneScanner scans. The somewhat washed-out appearance of the colors in both samples is a Color Printer trait.

We tested the viability and versatility of Apple's color publishing system by putting the Color Printer and Color OneScanner team through its paces. We used a Mac IIci equipped with 8 megabytes of RAM and System 7.0.1 as our test platform. The test images included several types of color prints — some with saturated colors and others with flesh tones and shadows — as well as a PowerPoint document that incorporated color graphics.

In the scanned-input phase of the test, we found that the Color OneScanner/Ofoto software combination made the scanning process intuitive enough, but the quality of the scans — based on the same histograms and spectrophotometric analysis used to test color flatbed scanners in "Getting the Picture: Color Flatbed Scanners" (May '93, page 106) — showed the OneScanner to be far from dead accurate at either capturing the true colors of an image or at preserving details in shadowy areas. Scanned images also had a distinct greenish cast.

One other problem we encountered with the Color OneScanner/Ofoto combination was occasional image distortion when we were scanning at the device's highest resolution, 1,200 dpi. Lines that intersected cleanly in the original print were broken and separated after scanning. And a section of a scanned rectangular image jutted out from the main image as if plate tectonics were at work. These distortions didn't occur often, but when they did, they made our scans unusable.

When we printed the scanned images, we were disappointed to discover that the Color Printer's output suffers from the same washed-out-color problem that plagues that of the Lexmark Jetprinter. Output quality improved significantly, however, when we printed to transparencies. Speed was what you'd expect from an inkjet printer — slow. Our full-page continuous-tone image took 5 minutes, 23 seconds to print, and the PowerPoint transparency took 10 minutes, 17 seconds.

The Bottom Line

By itself, the Apple Color Printer offers nothing to distinguish it from the competition. In fact, its mediocre speed and output quality and lack of network versatility limit it to fairly undemanding color-printing tasks. Similarly, the Apple Color OneScanner garnered unremarkable ratings. Like most other color flatbed scanners in its price range, the Color OneScanner proved incapable of producing highly accurate color scans, a real strike against it for serious prepress work. The one highlight of the OneScanner package is Light Source's Ofoto 2.0 color-scanner software, which simplifies the scanning process.

Overall, as a color publishing duo, the Apple Color Printer and Apple Color OneScanner may be up to handling the needs of businesses looking for an affordable way to produce color presentations or color proofs. However, we found Apple's color system to be unsuitable for prepress professionals, who would be better served with a more accurate scanner and a higher-quality color output device. Apple's stab at a low-cost color publishing system falls wide of the mark.

— Gregory Wasson

PERSONAL INFO MANAGERS

In Control 2.0

Attain adds calendar features to its top-flight to-do-list manager.

In Control is a to-do-list manager that's a cross between an outliner and a database program. The latest version provides even more powerful organizational tools than its predecessor by adding a calendar and reminder features, multiple-attribute columns, program linking, and enhanced print controls.

4½

In Control 2.0
Published by: Attain Corp., 50 Grove Street, Somerville, MA 02144; 617-776-1110.
List Price: $129.95.

Make a List

When you open an In Control document, the program presents a list-view window that displays all of your to-do tasks as topics and subtopics in outline format. Even if you're not familiar with traditional outliners, using the list view is simple.

A key new feature is In Control's date view, which displays your tasks in calendar format. The date view appears in a split screen with the list view. To assign a date to a task, you simply drag the task from the list view to the desired day on the calendar. Various options let you control the number of weeks displayed, the size of the text, and more.

You can also set reminders. When a data file that contains a reminder is open, a dialog box appears in order to alert you to an upcoming event. You can postpone, reschedule, or turn off the reminder as well as mark the task's check box to indicate that the task has been completed. If In Control isn't open, you're notified by an extension that activates a sound and flashes a small icon on the Apple menu. But there's no indication of which data file contains the reminder, so it's up to you to manually launch In Control and open the correct file. The company could improve this feature by allowing you to record your own reminder sounds or voice annotations. Furthermore, when the dialog box appears, it could display a full description of the event and give you the option of opening the related data file.

In the Field

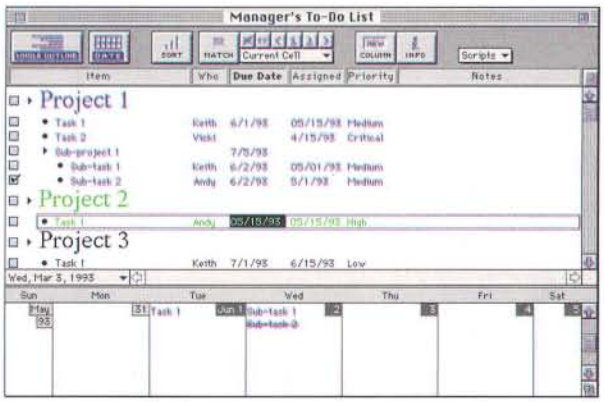
Borrowing from the database metaphor, In Control's resizable columns act as fields that let you attach additional information to your tasks, such as deadlines, assigned responsibilities, and priorities. You can then search, sort, and format your tasks based on column fields. New with version 2.0 is the ability to assign multiple attributes to a single column. For example, you may have assigned a task to both Dave and Susan. Version 2.0 lets you find the task by searching for either party.

To search for a task or group of tasks, you simply click on a cell that contains the criteria for the search (high-priority items, for example) and then click on the Match button, at the top of the list-view window. You can do complex matching (equal to or contain, less than, greater than, and so on) with only a few clicks. Sorting is just as easy — you click on a column and then click on the Sort button. Shift-clicking triggers a reverse sort, and you can even define special sort orders for attributes you define, so that the Priority column properly sorts as high, medium, and low rather than alphabetically. With its searching and sorting capabilities, In Control provides lots of flexibility, so you can view your to-do lists in just about any fashion.

We also like In Control's new Link command, which lets you attach documents and applications to tasks in your outline. You can open linked documents and applications, which appear in a pop-up menu, from within In Control. Unfortunately, you can't have a linked document and In Control open at the same time.

Our review of the first version of In Control faulted the program for its limited formatting and printing options. With version 2.0, Attain has addressed these issues admirably. A scripting option lets you use single keystrokes to initiate sorting, matching, hiding, or formatting. New type-style rules let you distinguish tasks from one another with font, size, and style differences that are associated with a task's level in the outline hierarchy.

And with Portfolio Systems' DynoPage Lite, you can get a print preview and the ability to print lists and calendars on a wide variety of paper sizes.



Version 2.0 of In Control features a split-screen date view that lets you assign to-do tasks to dates. Tasks with a strike-through have been marked completed.

The Bottom Line

If ever there was a program with the conscientious list maker in mind, it's In Control. Version 2.0's enhancements — especially the calendar features and program linking — make it well worth the $30 upgrade price for current users. For those who have not yet discovered In Control, it's one of the most intelligently designed organizational tools we've seen.

— Owen W. Linzmayer

TimeVision

Powercore's vision of calendar software comes up shortsighted.

TimeVision, from Powercore, is yet another entry in the crowded PIM arena. Designed as a single-user program, TimeVision provides many of the standard functions you expect in calendar software, although several major gaps in its feature set relegate it to second-string status.

TimeVision 1.0
Published by: Powercore, One Diversatech Drive, Manteno, IL 60950; 815-468-3737.
List Price: $99.

Face It

Probably the single most distinguishing feature of a PIM is its interface design. A program you use frequently should be attractive and intuitive. Although we found TimeVision's interface to be acceptable enough on a black-and-white PowerBook, on a color system, it resembles a mediocre HyperCard stack.

When you first open TimeVision, it presents you with a Day window, which includes two small monthly calendars to the right of the daily-events view. You select a date by clicking on it in one of the monthly calendars.

TimeVision also provides Week, Month, and List windows. However, unlike most other PIMs, it's not as flexible as it should be — for example, it doesn't provide preferences for bringing up windows other than the default Day window on startup, and none of its windows are resizable.

Another unnecessary restriction is that you can enter events directly only in the Day window. To do so, you select the beginning and end time for the event by dragging within the time bar at the top of the window. TimeVision then presents you with its PowerEdit palette, a dialog box that lets you enter, modify, and review event information. It includes entries for event description, type, and category as well as controls for repeating events and other options. You can group events into five types — To Dos, Follow-Ups, Holidays, Special Events, and Appointments.

One noteworthy TimeVision feature is its work-load indicator. In the two small monthly calendars it displays to the right of the daily-events view, TimeVision indicates heavily scheduled days by filling in the date squares — the more filled-in a square, the more events scheduled for that day. In addition, the program indicates overlapping events by stacking event lines in the time bar.

In the Week window, you can reschedule events by dragging and dropping them from one day to another, but that's the limit of the window's functionality. The Month window displays six months simultaneously, but the event information it displays is limited — you can't view your events in the Month window but instead can view only the work-load indicators.

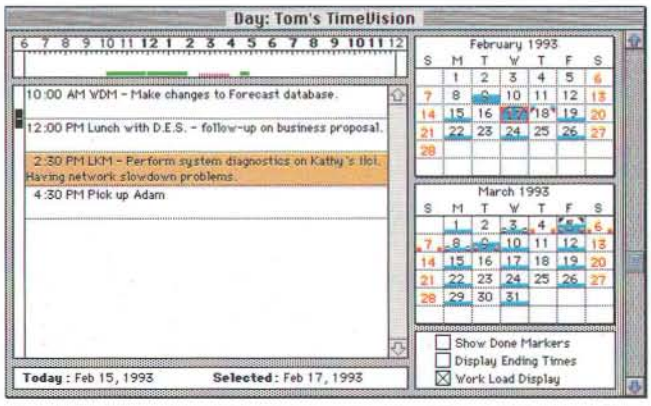
The List window displays events and to-do items in list format. Unfortunately, you can view your to-do items only in the List window — you can't view them in the Day or Week windows. Pop-up menus let you choose which types of items are displayed in your lists.

TimeVision provides two options for repeating events. By selecting the Repeat option in the PowerEdit palette, you can repeat an event at such intervals as weekly, biweekly, monthly, and every second Tuesday. By selecting the Replicate Event option, you can tell TimeVision to duplicate an event and can specify how many duplicates it creates as well as the interval between duplicates (every two days, for example).

You can group related events by creating any number of event categories. However, you're restricted to using a maximum of four letters for category names — an inexcusable limitation.

TimeVision provides a feature for opening and creating ASCII-text memos, but this feature essentially duplicates the functionality of text processors such as TeachText. You can also create, sort, and search Note Card files. However, we found that any number of shareware programs can handle your memo and notecard needs much better than either of TimeVision's throw-ins.

You can print any TimeVision window in a choice of customizable TimeVision formats. But the program does not support Day-Timer or other popular formats, as do most other calendar programs.



TimeVision's work-load indicators (the filled-in dates in monthly calendars) are useful for event planning, but the program's overall inflexibility is a major encumbrance.

The Bottom Line

Inflexible and missing several key features, TimeVision offers little in the way of innovation, despite its moniker. With such excellent Mac calendar programs as Now Up-to-Date and DateBook, we find it hard to recommend TimeVision under any circumstances.

— Tom Petaccia

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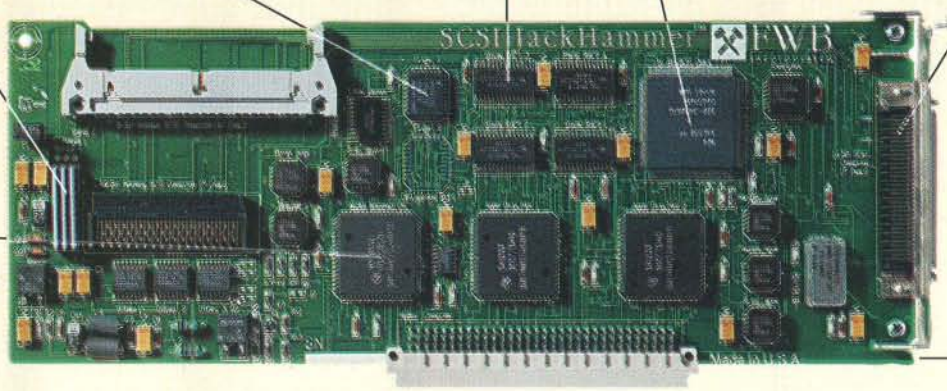

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DATA ANALYSIS

MapInfo 2.0

The latest release of MapInfo goes to the head of the class for geographic-data mapping.

MapInfo 2.0
Published by: MapInfo Corp., 200 Broadway, Troy, NY 12180; 518-274-6000.
List Price: MapInfo, $1,295; MapBasic, $795.

Competition in the Mac's desktop mapping arena just got hotter with the release of MapInfo 2.0, a program that lets users analyze data by linking it with geographic features. Prior to the latest release of MapInfo, Strategic Mapping's Atlas Pro was the clear leader in desktop mapping software. However, substantial improvements to MapInfo's interface, coupled with the addition of MapBasic — an optional tool for developing custom applications — has put MacInfo 2.0 ahead of its rival for high-end desktop mapping features.

Put It on the Map

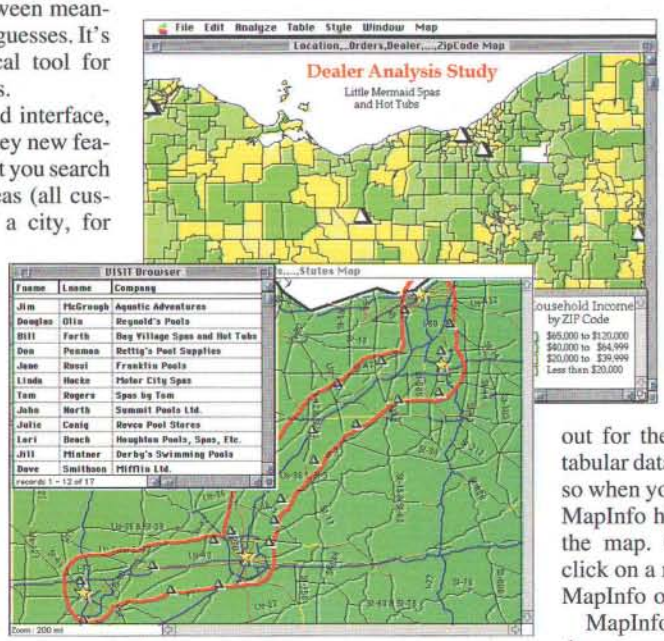
MapInfo can provide special insight into marketing and sales-related data, because it lets you view the data graphically on a map rather than in spreadsheet or table form. Whether you're trying to determine the optimal location for a new factory or the best way to take advantage of additions to your sales staff, MapInfo can make the difference between meaningful answers and muddled guesses. It's an especially good analytical tool for detecting patterns and trends.

In addition to its improved interface, MapInfo 2.0 boasts several key new features: selection buffers that let you search for data within specified areas (all customers within 10 miles of a city, for example); 17 map-projection systems, including Mercator, Albers, Lambert, and Robinson; support for Apple events, AppleScript, and Balloon Help (MapInfo doesn't support publish-and-subscribe, however); a new presentation-layout window that lets you combine multiple elements on a single page; and file compatibility with its nearly identical Windows sibling.

MapInfo combines a powerful database manager with graphical mapping features. It can map any type of data with a spatial or geographic component, such as an address, a ZIP code, or longitude and latitude coordinates. The program presents the data as either shaded regions or symbols on a map.

To get your data onto a map, MapInfo first organizes it into a database table and then geocodes it by assigning *x* and *y* coordinates to each data record. It does this by matching the data's geographic components, such as street addresses, to a MapInfo table that already has the proper *x* and *y* coordinates. Once your data has been geocoded, you can map it.

The program supplies a collection of thousands of digitized maps and their associated data tables, and you can create your own maps with the program's drawing tools or with an illustration program. The U.S. city-street maps that come with MapInfo are derived from the U.S. Census Bureau's Tiger files, which include block-by-block address numbers for each street. You can also purchase additional Tiger-format files from MapInfo Corp. for virtually every city in the U.S. With your data represented geographically, you can use MapInfo to produce near-presentation-quality reports.



MapInfo combines database and mapping features to help users analyze geographic data. Support for map layers lets you view data in a variety of ways.

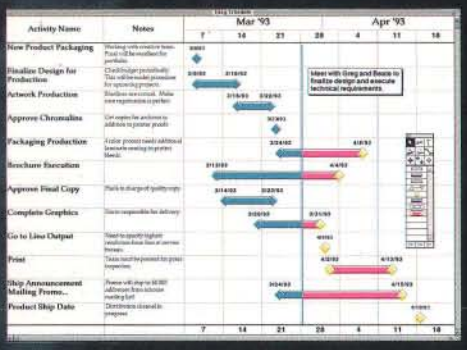
Multiple Layers

With its support for multiple map layers, MapInfo lets you combine and view your data in different ways. The layers work much like the transparent overlays that come with printed maps. Each map layer represents a table of data. For example, you can begin with a basic street map of San Francisco and create additional layers that show where your customers and delivery zones are located. You can also use MapInfo to display demographic information, such as households that have a specific average income. Besides viewing your data on a map, you can view it in table or chart format.

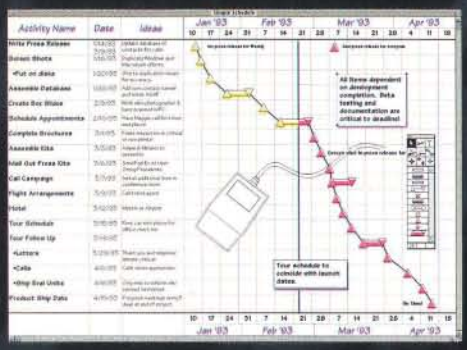
MapInfo lets you examine each map layer separately or view all the layers together — a powerful analytical feature. You can zoom in to view map details or zoom out for the big picture. Links between tabular data and map layers are dynamic, so when you select a data item in a table, MapInfo highlights the related point on the map. Correspondingly, when you click on a map object with the Info tool, MapInfo opens the associated data file.

MapInfo makes it easy to get data into the program by letting you import files directly from Excel, Lotus 1-2-3, and FoxBASE. Powerful selection and SQL

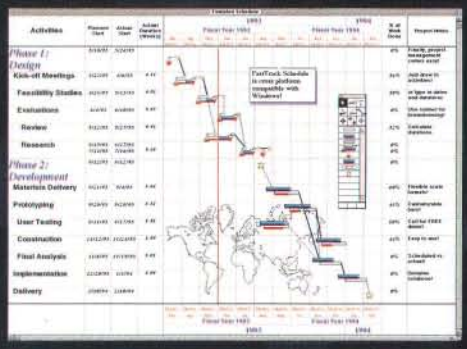
It's about Time!



And Projects!



And Schedules!



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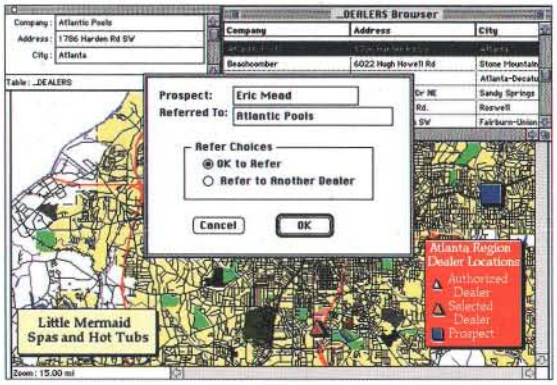


With the addition of MapBasic, MapInfo 2.0 can serve as a tool for developing mapping applications that use custom interfaces and business-specific terminology.

query tools let you group and organize data acquired from local databases or from SQL-based corporate databases over a network (MapInfo provides its own SQL query tool — it does not support Apple's Data Access Language).

The program's data-management and -manipulation tools are excellent. The powerful Find and Select commands let you zip through map layers in search of specific objects of interest. MapInfo's built-in area, bar, line, pie, and scatterplot charts let you graph data within the program without making you resort to a separate spreadsheet program.

MapInfo's newly refashioned interface has been carefully thought out and implemented. It boasts clean multiwindow views into the program's relational geographic database. The dialog boxes for accessing external databases (especially SQL-based ones) are particularly well designed.

MapBasic

MapInfo further sets itself apart from the competition by providing an optional programming environment called MapBasic. With the $795 MapBasic, companies can create custom applications tailored for their specific vertical markets. Applications can use custom menus and special terms familiar to a particular business or organization.

To help you get started, the MapBasic system includes a watch-me mode that works much like a spreadsheet program's macro builder, letting you create MapBasic scripts automatically. A clever command window within the MapInfo application helps you learn the correct syntax for MapInfo scripts by displaying the appropriate command when you select a menu option. MapBasic can work directly with other applications by sending and processing Apple events. It can also work with external scripting environments, such as AppleScript and UserLand's Frontier, and can run HyperCard external commands. But like MapInfo, it doesn't support publish-and-subscribe, an unusual omission in an Apple-events-aware application. MapBasic also produces scripts that run without modification under MapInfo for Windows 2.0, an important feature for mixed Mac/PC environments.

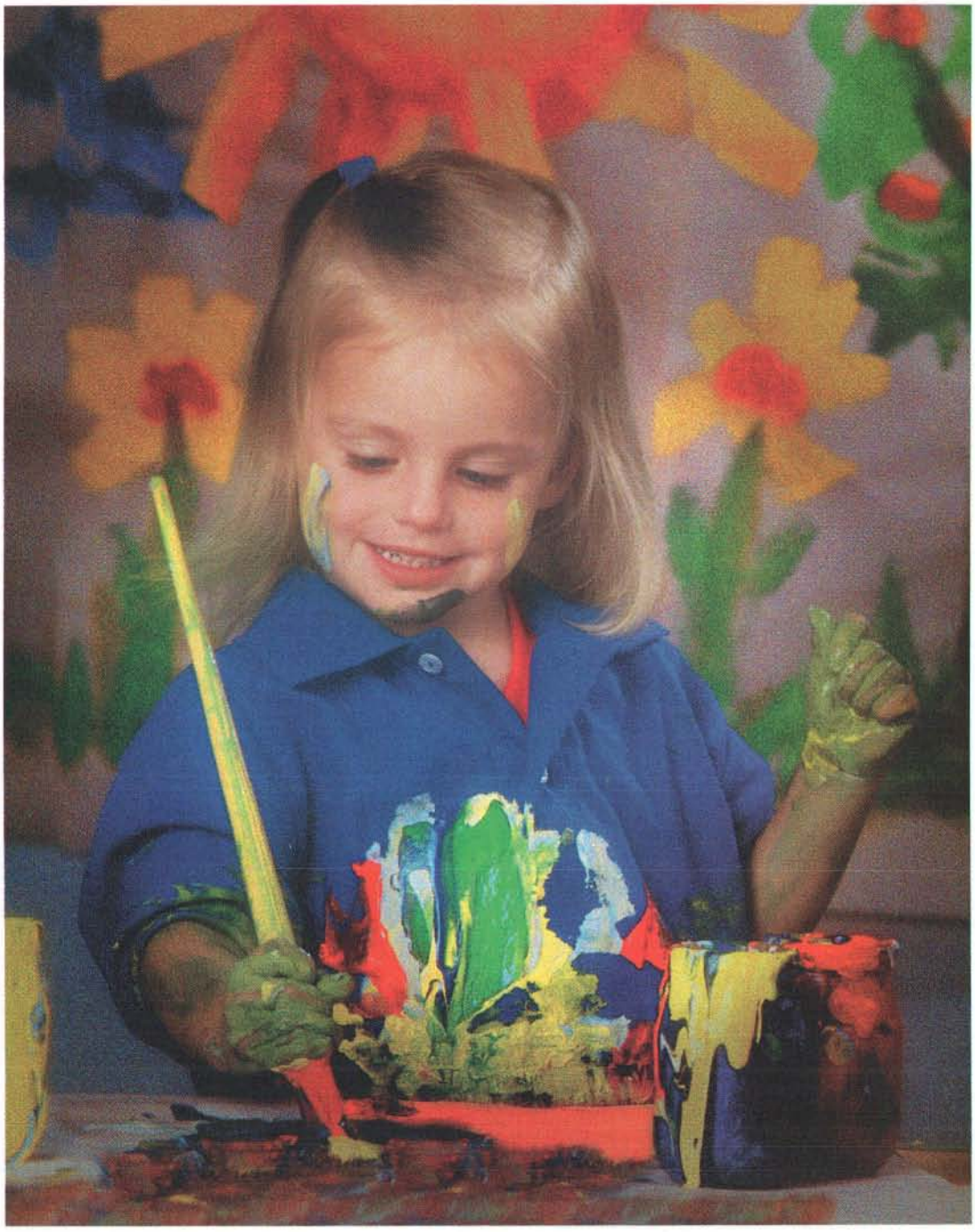
Although MapInfo has made significant gains in usability with version 2.0, chief rival Atlas Pro continues to maintain the edge for ease of use as well as for more-flexible drawing and annotation tools. However, these advantages aside, MapInfo takes a clear lead in sheer mapping power. Moreover, those willing to spend an additional $795 for MapBasic gain the ability to create turnkey custom mapping applications, specialized mapping utilities, and extensions to the primary mapping interface.

Atlas Pro's query tools also pale in comparison with MapInfo's powerful SQL command subset, which includes special geographically oriented selection operators (Within, Contains, Contains Entire, and Intersects) for extracting spatial information from SQL databases and mapping it.

The Bottom Line

By combining powerful new mapping features, a programming environment, and an improved interface, MapInfo Corp. has designed the most powerful desktop mapping program available for general business applications. If you're looking for a way to make better sense of the marketing and sales-related geographic data you're currently analyzing with your spreadsheet or database program, MapInfo is the route to take.

— Don Crabb



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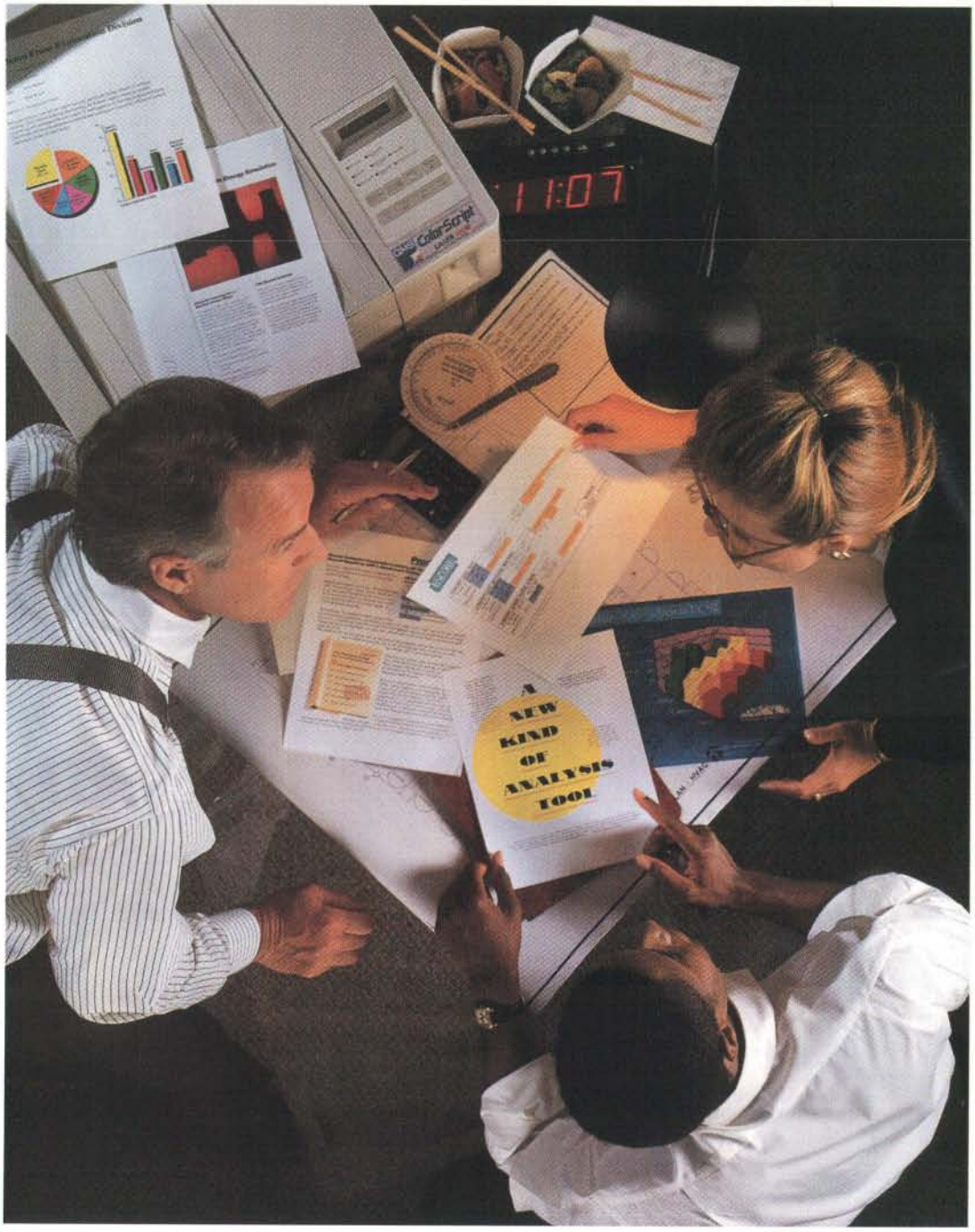

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FONTS & TYPOGRAPHY

FontMonger and Incubator Pro

Ares' Swiss-army-knife utility bests Type Solutions' for font-collection enhancement.

The Mac is blessed with an abundance of fonts, but most don't include such niceties as fractions and small capitals. And if you want to turn your company logo into a font character or convert fonts between the PostScript and TrueType formats, you're also out of luck — unless, of course, you acquire a font utility. Both FontMonger and Incubator Pro are utilities designed to let you modify the fonts you use frequently. FontMonger is a broadly useful tool that produces good-looking fonts in a variety of formats. Incubator Pro is a more limited offering that remains tethered to its TrueType roots.

FontMonger 1.5.7
Published by: Ares Software, 565 Pilgrim Drive, Suite A, Foster City, CA 94404; 800-783-2737 or 415-578-9090.
List Price: $149.95.

Incubator Pro 2.01
Published by: Type Solutions, 91 Plaistow Road, P.O. Box 1227, Plaistow, NH 03865; 603-382-6400.
List Price: $129.95.

FontMonger

FontMonger 1.5 is a substantial upgrade to Ares' Swiss-army-knife tool. It combines features for font creation, modification, and conversion in one easy-to-use package. FontMonger opens fonts from a dozen Mac, PC, and NeXT formats, even if you don't have them installed. It displays each font in either a keyboard window or a chart.

You can rearrange a font's keystroke assignments to suit your needs — perhaps you want easier access to accented characters. You can combine characters from different fonts (maybe adding frequently used characters from Zapf Dingbats) as well as import simple EPS and Illustrator graphics — such as company logos — and assign them to keys.

FontMonger offers four built-in alterations — small caps, inferior, superior, and slanted — that you can apply to any character. Its Alter Character window lets you tweak individual characters in a variety of ways. For example, you can adjust a character's position, height, width, slant, and rotation. You can then save these custom alterations and apply them to other characters.

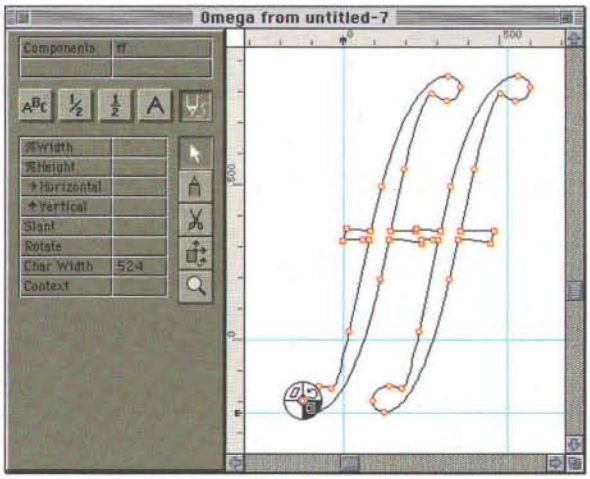
New with version 1.5 is the ability to edit character outlines. The pen and scissors tools let you change the shape of an existing character (such as a logo) or create a new one (perhaps a ligature). A clever three-in-one gizmo tool can scale, slant, or rotate an outline from a selected reference point.

You can also make fractions, accented letters, and other composite characters. The ability to create fractions is a real boon, although you must create each one individually; we'd like to see a command that automatically generated commonly used fractions. If all these alterations aren't enough, you can export character outlines in EPS, Illustrator, or PICT format for further embellishment in a graphics program.

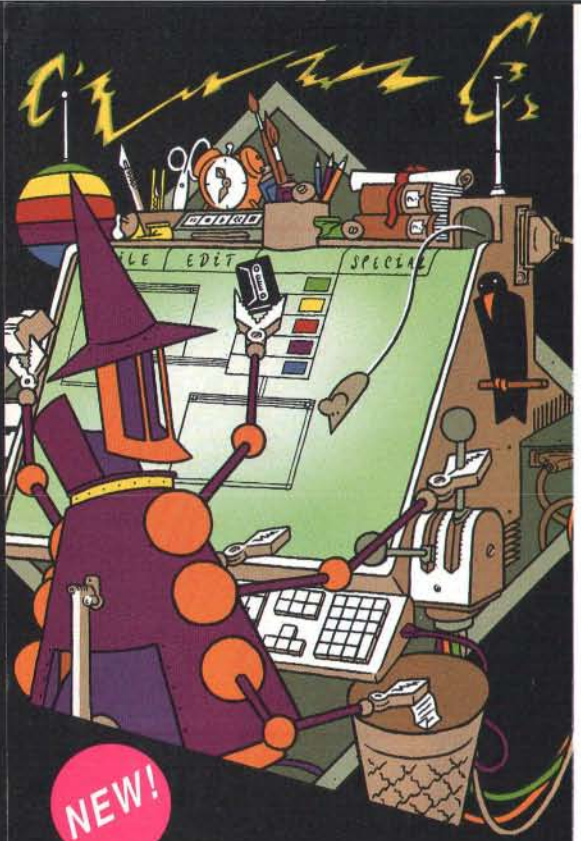
Once you're ready to save a new font, FontMonger automatically generates the font metrics, hinting, and screen bit maps. You can make a complete font family (plain, bold, italic, bold italic) in a single session; FontMonger saves them all in a suitcase to ensure that family relationships are maintained.

FontMonger can also convert fonts between file formats, either one at a time or in batches. This lets you preserve your type-library investment by updating older fonts (such as PostScript Type 3) and allows you to move to other platforms without having to buy new versions of fonts. It also provides access to a multitude of inexpensive PC fonts. FontMonger supports all Mac font formats, many PC formats (PostScript, TrueType, Nimbus Q, CorelDraw WFN, LaserMaster, Intellifont), and NeXT PostScript. The conversion process in version 1.5 is much improved over the previous version's, and FontMonger can automatically locate all the fonts on a hard disk and add them to the conversion list.

The quality of FontMonger's fonts is good, although converted fonts never look exactly like the originals. FontMonger rehints every font, even if you don't alter any characters, which means that you always lose the hinting supplied by the font's designer (hinting maintains character shapes at small point sizes and low output resolutions). FontMonger does,



FontMonger is a versatile utility that lets you edit font characters in a variety of ways. The latest release even lets you modify outlines to create new elements, such as the ligature shown here.



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however, maintain the kerning pairs of a preexisting font.

FontMonger's only foibles appear to be in its handling of Option-key characters. When we converted Apple's Zeal symbol font from TrueType to PostScript format, 18 Option-key characters were lost. And FontMonger can be temperamental about where you place font characters — in some cases, a character placed on a supposedly vacant Option-key combination was replaced at output time by a member of the Symbol font.

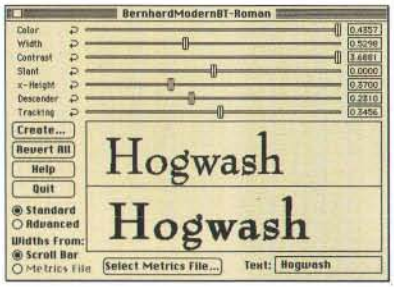
Incubator Pro

Incubator Pro's approach to font manipulation is different from FontMonger's. Incubator Pro doesn't let you remap the keyboard, alter individual characters, or create fonts from scratch. Instead, it operates on existing fonts as a whole, letting you adjust seven typographic parameters: color, width, contrast, slant, x-height, descenders, and tracking.

When you open a font, Incubator Pro determines numerical values for each parameter unique to that font. By tweaking the appropriate values, you can make a bolder version of a font, for example, or a more condensed one. You can return any of the controls to its default by clicking on the appropriate Revert button. Incubator Pro also provides two modes of operation — Standard and Advanced. Standard limits the range for each control, helping novices modify fonts without creating typographic nightmares. Advanced imposes absolutely no constraints on users.

The ExactMatch feature lets you take the font-width and kerning information contained in a PostScript font's AFM (Adobe Font Metrics) file and apply it to a different font (PostScript or TrueType). This can be useful if you lack the original font or if you want to try different fonts in a layout without disrupting the formatting and line breaks.

The first incarnation of Incubator Pro was a TrueType-only utility, and version 2.01 remains true to its roots. Although you can now edit PostScript Type 1 fonts, the program converts them internally into TrueType format and then back to PostScript when you save the edited font. Besides raising the obvious issue of quality degradation, this method makes opening and editing PostScript fonts two to three times more time-consuming than working with TrueType.



Incubator Pro's font-enhancement abilities are limited to the adjustment of seven parameters.

We encountered other frustrations as well. Incubator Pro supports just two Mac-based formats — PostScript Type 1 and TrueType — and you can convert only one font at a time. And because the utility recognizes only installed fonts, building a font family is a hassle — each time you create a new family member (bold, for example), you must quit the program and install the new font before you can make the next member. It also redraws characters on-screen — slowly — at the slightest provocation, even when they haven't been altered.

Also to our dismay, Incubator Pro conflicts with such font-menu utilities as Adobe Type Reunion and it has problems with fonts from certain vendors such as Image Club Graphics. And surprisingly for a TrueType-based product, it can't properly convert Castellar, a font in Microsoft's TrueType Master Set, into PostScript format.

Although Incubator Pro has improved its auto-styling and hinting algorithms, some font characters still suffer from obvious irregularities, including bumpy outlines and misshapen serifs. It also failed to create the correct Option-key characters (such as ∏ and ◊) in some fonts, substituting characters of the wrong size and/or shape.

The Bottom Line

A font utility is an excellent tool for making quick, simple alterations to your font collection. Despite its limitations, Incubator Pro can be useful if you simply want to tweak typographic features such as weight or width. Otherwise, we recommend FontMonger. Its simplicity; robust feature set, ranging from keyboard mapping to outline editing; and high-quality output make FontMonger an incredible bargain.

— *Aileen Abernathy*

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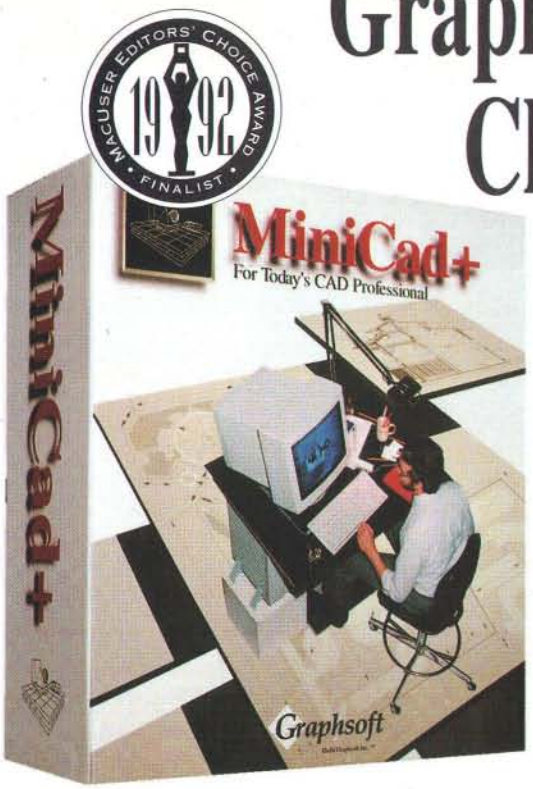

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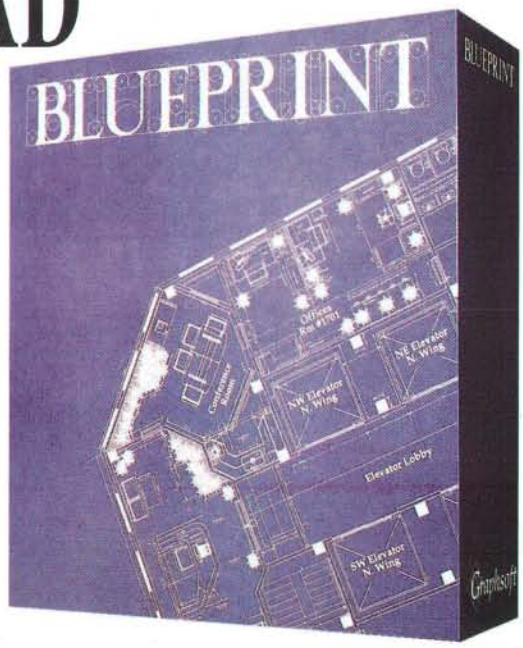

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- ☐ Smart Cursor for locating snaps
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- ☐ editable line styles
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- ☐ color by object or layer
- ☐ DXF translator - free
- ☐ unlimited layers
- ☐ global symbol editing
- ☐ on-line prompts
- ☐ unlimited drawing space
- ☐ pick-up and put-down attributes
- ☐ selection by properties
- ☐ auto-insert symbols in walls
- ☐ hierarchical symbol library
- ☐ add & subtract surfaces
- ☐ fractional feet and inches option
- ☐ fillets
- ☐ editable fills
- ☐ beziers
- ☐ wall-join
- ☐ chamfers
- ☐ tolerancing
- ☐ unlimited saved views
- ☐ hatching
- ☐ polylines
- ☐ classes
- ☐ export EPSF
- ☐ free Claris CAD translator
- ☐ round wall caps
- ☐ edit inside groups
- ☐ scale by layer

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- ☐ walkthrough and flyover tool
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- ☐ sweeps, extrusions & meshes
- ☐ 3D reshape tool
- ☐ roof & slab tools
- ☐ 3D smart cursor
- ☐ auto sectioning
- ☐ multiple view

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- ☐ export reports to text, merge,dif, & sylk
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- ☐ search or select by field value
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2D CAD:

- ☐ smart walls
- ☐ Graphic Guide for locating snaps
- ☐ advanced auto-dimensioning
- ☐ editable line styles
- ☐ pan by scroll bars
- ☐ color by object only
- ☐ DXF translator - extra charge
- ☐ unlimited layers
- ☐ fillets
- ☐ editable fills
- ☐ beziers
- ☐ wall-join
- ☐ chamfers
- ☐ tolerancing
- ☐ 9 saved views
- ☐ hatching

3D CAD:

none

Integrated Database/Spreadsheet:

none

Programmability:

none

Blueprint 4 $ 295.00

2D CAD:

- ☐ smart walls
- ☐ Smart Cursor for locating snaps
- ☐ advanced auto-dimensioning
- ☐ editable line styles
- ☐ pan by scroll bars or hand
- ☐ color by object or layer
- ☐ DXF translator - free
- ☐ unlimited layers
- ☐ global symbol editing
- ☐ polylines
- ☐ unlimited drawing space
- ☐ file compatible with MiniCad+
- ☐ fractional feet & inches option
- ☐ auto-insert symbols in walls
- ☐ hierarchical symbol library
- ☐ add & subtract surfaces
- ☐ pick-up and put-down attributes
- ☐ fillets
- ☐ editable fills
- ☐ beziers
- ☐ wall-join
- ☐ chamfers
- ☐ tolerancing
- ☐ unlimited saved views
- ☐ hatching
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- ☐ edit inside groups

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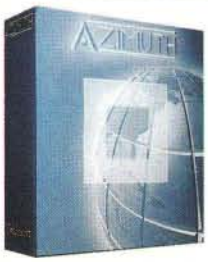

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CIRCLE 208 ON READER SERVICE CARD.

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CIRCLE 194 ON READER SERVICE CARD.

COLOR MANAGEMENT

ColorSense

Kodak's entry-level image-management software helps users start making sense of color.

If you're looking to add more color images to newsletters and presentations — without the hassle of endlessly fiddling with color adjustments — Kodak's new entry-level ColorSync-compatible color-management product may be a godsend. ColorSense is the first complete shrink-wrapped product to address color matching among the three hardware devices most frequently used in desktop color processing — scanners, monitors, and printers. And it's the first that doesn't require a specific company's hardware device or software application to do so.

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ColorSense 1.0
Published by: Eastman Kodak, 343 State Street, Rochester, NY 14650; 716-724-4000.
List Price: $499.

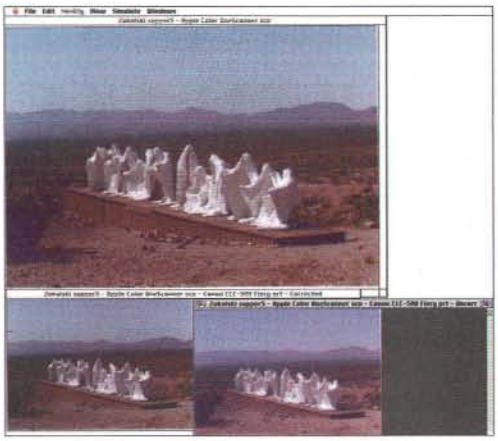
Calibration

ColorSense comprises four main components — the Calibrator, the Configure application, the Manager application, and a system extension. Installation is straightforward — an installer program places all the components in their proper locations. In addition to software, you must install the ColorSense Calibrator, a suction-cup monitor-calibration device that plugs in to the Mac's ADB port. The Calibrator also acts as a copy-protection "dongle" — the software doesn't run without it.

The ColorSense Configure application is for calibrating your monitor and scanner. Monitor calibration is simple — you attach the calibration device to the front of your monitor and wait while the software runs the calibration routine. When it's finished, the application prompts you to remove the device and your monitor profile is updated to reflect the latest calibration data. You can then adjust your monitor's gamma and white point to match your lighting conditions.

Calibrating scanners is a two-step process. You first use the scanner's software to scan the calibration target supplied with ColorSense. You save the result as an RGB TIFF file. Then, with the ColorSense Configure application, you choose your scanner from the application's Calibrate menu. A dialog box prompts you to locate the scan of the calibration target. The rest of the process is automatic. As with monitor calibration, the device profile is updated to reflect the latest calibration data. Because monitors and scanners can vary considerably over time, it's worth performing calibrations regularly — the manual suggests every couple of weeks.

The ColorSense Manager application lets you make adjustments to overall image tone and color, view a simulation of printed results on-screen for different destination profiles (with or without color correction), and save color-corrected images for specific target devices. When you open an image, you can designate a source profile — such as a scanner, monitor, or Photo CD disc — so ColorSense Manager knows exactly what colors are represented by the RGB values in the image (ColorSense doesn't support CMYK).



The first all-in-one color-management product for scanners, monitors, and printers, ColorSense even lets you view simulated output (two bottom windows) from different printing devices.

ColorSense's Modify Color command presents a window with a low-resolution version of your target image — representing the current hue and brightness/contrast settings — surrounded by eight additional versions that show the results of different settings. By clicking on one of the surrounding images, you can select the settings that correspond to that image. Thanks to ColorSense's responsiveness to monitor calibration, this process is simple and effective — what you see on the monitor is indeed what you get from the printer.

Some formidable number crunching takes place when ColorSense transforms data between one color-order system and another, so the process of creating simulations and color-correcting images takes time — three or four minutes for a 4-megabyte color image on a Macintosh IIfx. However, ColorSense Manager has a well-implemented batch-processing feature for converting multiple images. For batch processing, all images must share the same source and target profiles. For overnight processing, you can set ColorSense Manager to shut down your system when the conversion is complete.

The ColorSense Extend extension brings ColorSense Manager's simulation and color-conversion features to other applications. When ColorSense Extend is turned on, a button appears in the window title bars of other applications. Clicking on the button creates a window that displays the simulated output for the current output profile (you control target profiles with the ColorSense Extend control panel). You can then print the document, and ColorSense will apply the appropriate color correction for your printer. However, you must make sure the selected profile does indeed match your current printer — ColorSense isn't

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1.2 Gig	10 ms	$1298	$1348
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3.5" 1.1 Gig	8.5 ms	$1178	$1278
5.25" 1.2 Gig	11.5 ms	$1148	$1238
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CIRCLE 172 ON READER SERVICE CARD.

smart enough to automatically select the right profile based on your Chooser selection.

ColorSense works, but it has several limitations. You can't create your own device profiles, so if you have a scanner, monitor, or printer that isn't on ColorSense's profile list, you won't be able to use the program effectively. The list of supported devices is long, and Kodak promises additional profiles — if your device doesn't appear on the current list, check to see if it has become available since the program shipped.

Second, because ColorSense deals strictly with RGB color and can't accept CMYK input or generate CMYK output, it isn't useful for prepress work.

Third, the program doesn't let you perform color correction from within applications that generate custom PostScript code. Examples of such programs are Aldus FreeHand and PageMaker, Adobe Illustrator, and QuarkXPress. You *can*, however, place color-corrected images in these programs — they'll look washed-out on-screen but will print correctly to a supported printer.

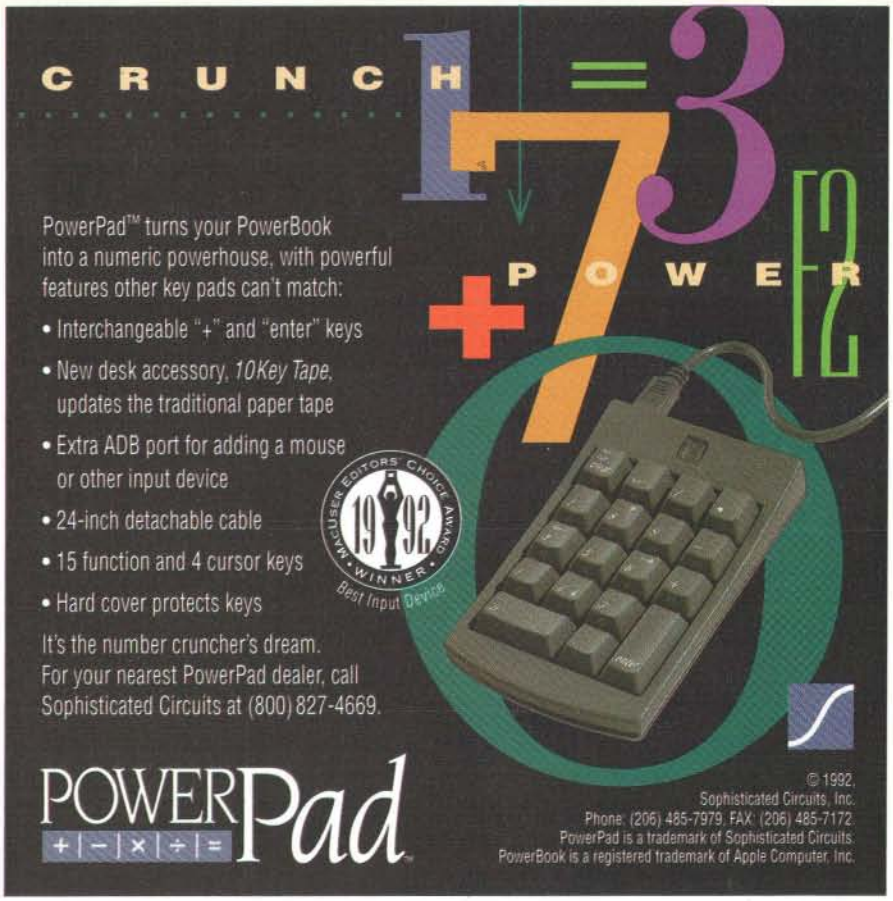
ColorSense requires System 7, and although the documentation recommends at least 2 megabytes of RAM, we suggest 5 megabytes as a more realistic amount. It also requires QuickTime 1.5, which is included. The complete package takes up about 2.5 megabytes of disk space.

ColorSense's documentation deserves special mention. In addition to a detailed description of all the ColorSense functions and how to use them, it contains a clear and well-written discussion of the often arcane topics related to color imaging.

The Bottom Line

ColorSense won't turn your Mac into a prepress workstation — it simply isn't aimed at prepress applications. But if you're a novice at handling color images or if you want to expand the use of color images in your documents, ColorSense is an excellent helpmate. It allows your color scanner, monitor, and printer to produce consistent results without incessant tweaking. At $499, it costs only a little more than some monitor-calibration devices that don't offer complete color management. It's a good value and a promising first step toward WYSIWYG color for mainstream users.

— Bruce Fraser



CIRCLE 174 ON READER SERVICE CARD.

Attention Network Managers:

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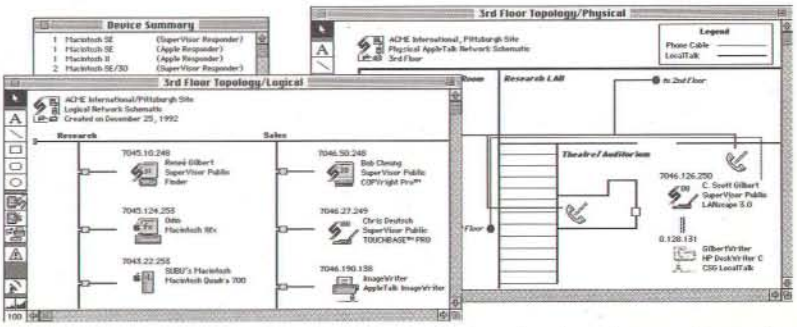

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CIRCLE 93 ON READER SERVICE CARD.

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QUICK CLICKS

DiskFit Direct

★★★★½

DiskFit Pro

★★★★½

Dantz Development has moved beyond fitting data onto backup media — the company is now trying to fit software to customers just as carefully. DiskFit, its exemplary backup program, now comes in two flavors: the bargain-priced DiskFit Direct, for users with simpler needs, and DiskFit Pro, for those more-demanding users.

DiskFit Direct contains the core programming of DiskFit with as few choices as possible left to the user: You can back up only your startup disk and that only onto floppy disks. An easy-to-understand main screen guides you in creating a *Smartset* of floppy disks, which contains the entire contents of your startup disk on as few floppy disks as possible. Subsequent backups are quick and efficient: DiskFit Direct scans the contents of both the startup disk and the Smartset to determine which floppy disks are needed — and which ones *aren't* — in order to back up only what has changed since the last backup.

DiskFit Pro offers users with more-complex needs far more flexibility — at a higher price. You can back up any volume, folder, or file with options that let you exclude particular files or folders, and you can even qualify what types of files you want backed up (for example, only applications or only data files). DiskFit Pro also provides multiple backup-medium options — basically, you can use any medium except tape. If you're backing up onto SyQuest cartridges, you have a choice of how files are assigned to cartridges: You can use the Smart Duplicate option to back up specific 80-megabyte or smaller disk partitions onto specific cartridges, or you can let DiskFit Pro make the decisions about how to split the contents of your 80-megabyte or larger hard disk into a Smartset of cartridges. For timed backups, DiskFit Pro provides a control panel that reminds you when it's time to back up. The program also works over any kind of network/server setup. Yet, even with all these options, DiskFit Pro's interface is just as easy to understand and use as DiskFit Direct's.

Both DiskFit Direct and DiskFit Pro use Dantz's proprietary file-copying routines, which are many times faster than the standard Finder file-copying routines (under either System 6 or System 7). The backed-up files are stored in Finder format (rather than in a compressed format) on the backup media, so you can access them directly from the Finder as well as through the DiskFit Direct or DiskFit Pro programs. To help you locate specific backed-up files quickly, the DiskFit programs create a report of file and folder locations after each backup, in the word-processing format you specify.

These two intelligently targeted programs — together with Dantz's Retrospect and Retrospect Remote for unattended network backup to tape drives or servers — are a prime example of how to give Mac users *exactly* what they need, without overkill. Purchasers of these products can rest assured that their money won't be wasted on needless bells and whistles.

Dantz Development Corp., 1400 Shattuck Avenue, Suite 1, Berkeley, CA 94709; 510-849-0293. DiskFit Direct, version 1.0, $49.95. DiskFit Pro, version 1.1, $125.

— *Ken Gruberman*

LinksWare

★★★

Hypertext's day as a cool buzzword came and went years ago, but hypertext links are still a useful way to give browsers access to chunks of associated information — for example, clicking on a name that brings up background information or a picture. And now there's a way to create hypertext without learning an authoring environment such as HyperCard; it's called LinksWare.

LinksWare uses Claris' XTND technology to let you establish hypertext links among documents created by many popular word-processing and graphics applications. You don't need to import these files into a LinksWare document; if XTND can open them, LinksWare can create links based on their contents — without modifying the source documents in any way. The resulting format is suitable for read-only media such as CD-ROMs as well as for use on a hard or floppy disk.

Creating a link between documents is simple. Launch LinksWare, and open your first document. Select the Add Link command, and then double-click on the word to which you want to establish a link. If you've opened a graphics file, you can attach a link to any rectangular area in the graphic. Then select the file to which you want the word or graphic area to be linked (LinksWare also lets you link to QuickTime movies and certain sound files). Double-clicking on the word (or linked area) opens the linked file. You can scroll to a location within that file, resize and position the window, and use the Bind Link command to ensure that the linked window always opens exactly as you've set it up.

LinksWare comes with a read-only version of the application, so you can easily distribute your source files, XTND translators, and links file to your intended audience. There's no limit on the number of read-only files you can distribute, although LinksWare Corp. requires a modest royalty payment if you want to sell hypertext that you've created with LinksWare.

The LinksWare method isn't without its faults. XTND can choke on files or format them bizarrely. LinksWare can be inconsistent at times about showing and hiding links, and it sometimes has trouble remembering the location of its own windows (as opposed to those in linked files). Also, you can't have different files linked to different occurrences of the same word — for example, linking the word *mouse* to a movie of a scurrying rodent in one location and to a picture of a computer input device in another — unless you use a workaround. In addition, the documentation is sparse and doesn't describe some important aspects of the program as well as it should.

On the other hand, we found the company to be extremely responsive to customer input; as we went to press, LinksWare Corp. was rushing out version 3.0 to fix many of the problems mentioned here and to add other capabilities as well, such as the ability to make links to AppleScript scripts.

LinksWare is an interesting program with the potential to be great. And if you need to produce hypertext in a hurry, it may be just the ticket.

LinksWare Corp., 812 19th Street, Pacific Grove, CA 93950; 408-372-4155. Version 2.3. $189.

— *Eric Taub*

Apple Adjustable Keyboard

★★★½

Hours of typing on conventional keyboards, which puts your hands at an unnatural angle, can make many users' wrists ache. Fortunately, Apple has recognized this problem and has done something to help those of us who always keep a wrist splint close at hand.

The Apple Adjustable Keyboard consists of two halves you can adjust outward by as much as 30 degrees. So that you can avoid bending your hands up at the wrist as you type (which can exacerbate any discomfort), detachable wrist rests are also included.

The keyboard looks different from a standard keyboard: The space bar and Tab and Caps Lock keys are bigger, and some less important keys, such as the function keys, are smaller. Excellent additions to the standard key set are four tiny keys that let you record and adjust the volume of sound.

The biggest change, however, is that the numeric keypad is now a separate keyboard with its own ADB cable and wrist rest. It contains cursor keys, screen-navigation keys, and 15 function keys. You can attach this smaller keyboard to either the left or right side of the main keyboard, which is nice for lefties (the wrist rest is obviously designed for right-hand use, however). By placing the numeric keypad on the left side and the mouse on the right (or vice versa), you can quickly input data into a spreadsheet without having to move your hand from the mouse.

There are drawbacks, however. If you place both the numeric keypad and the mouse to the right of the main keyboard (a likely arrangement if you're right-handed), you spend a lot of time stretching over the keypad to reach your mouse. And by placing the function keys in three rows of five on a separate keypad rather than in a single row above the main keys, Apple has made them a lot less convenient to use. You find yourself having to stop work to search for function keys and for the Page Up, Page Down, and Home keys. Obviously, this won't be a problem for users who don't have ingrained keyboard habits; even so, the new design discourages the use of the function keys at all. In addition, the detachable wrist rests are just a tad too detachable. We found that every time we moved the keyboard or adjusted its angle, the wrist rests came off.

Still, at just $34 more than Apple's regular Extended Keyboard, the Apple Adjustable Keyboard is a wise buy for anyone who finds typing painful, who wants to try to avoid future problems such as repetitive-strain injury, or who doesn't need a numeric keypad or function keys.

Apple Computer, 20525 Mariani Avenue, Cupertino, CA 95014; 408-996-1010. $219.

— *Victoria von Biel*

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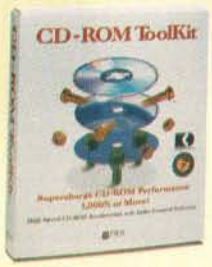

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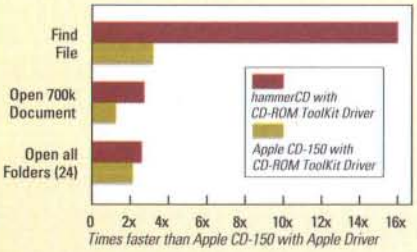

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CIRCLE 88 ON READER SERVICE CARD.

Small Blue Planet

Map lovers, rejoice: Those earth-illuminating satellite images you've long been coveting are finally desktop-accessible — along with some of the other public-domain planetary data the U.S. government has spent billions on gathering — on a CD-ROM called Small Blue Planet. Subtitled The Electronic Satellite Atlas, the disc is packed with spectacular 8-bit renderings from a variety of governmental agencies, including NASA, the U.S. Geological Survey, the National Oceanic and Atmospheric Administration, and even the CIA.

The images are organized into three interactive atlases: The Global Relief Map, the USA Relief Map, and the World Political Map. The relief maps are beautifully rendered, showing geological features in amazingly crisp detail. You can pan across the landscapes and then zoom in on areas of interest, such as seafloor elevations, the street grid of San Francisco, or evidence of ancient camel trails in the Desert of Oman. By clicking on buttons on the maps, you can bring up annotations (which you can also add), cross-referenced satellite images, or aerial photos. The marquee tool lets you select and copy images into other programs.

The satellite images provide a unique perspective on ecological damage, revealing the clear-cutting of forests in the Pacific Northwest and the Amazon, oil fires in the Middle East, and the hole in the ozone layer over Antarctica.

The World Political Map, updated through March 1, 1993, includes newcomers such as Slovakia. Click on any country, and an almanac supplies you with relevant statistics, along with briefs about its history, politics, geology, and environment.

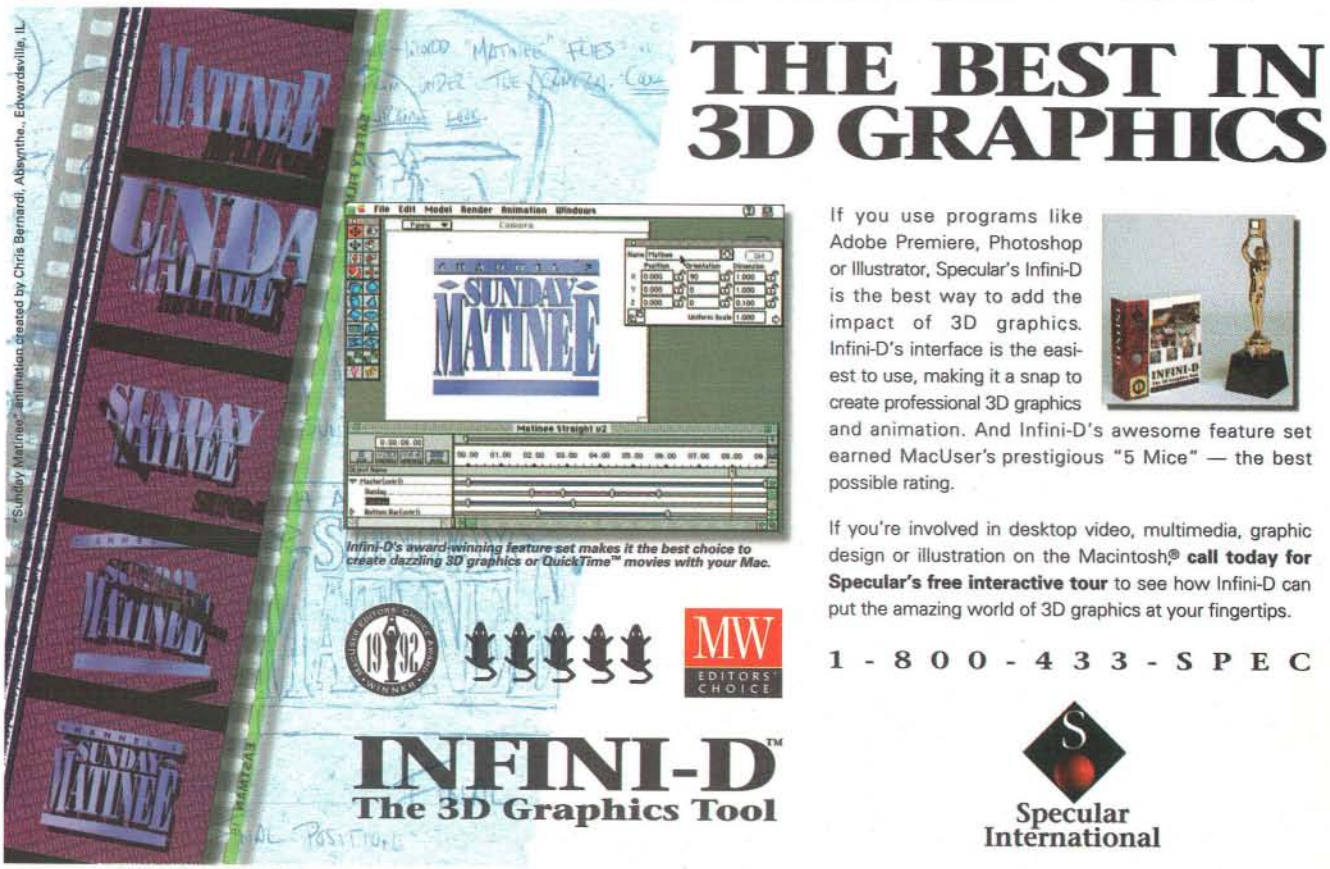
As a final treat, Small Blue Planet includes the Chronosphere, which shows how day and night relate to date and time across the earth. Set the map in motion to watch the patterns of light and darkness change throughout the year, or point and click to find the current date and time anywhere on earth. The Chronosphere module is available separately on a floppy disk for $59.

Small Blue Planet has an attractive interface, but it's not as intuitive as we'd like. There are no distance scales or color keys to help you interpret the map hues. The Image Gallery displays its wares at random, with no index or means of directly accessing a specific image. And the annotations suffer from typos and grammatical problems that might give teachers pause.

These quibbles aside, Small Blue Planet offers the most-detailed maps available in digital form and should delight educators, map lovers, and armchair travelers alike.

Now What Software, 2303 Sacramento Street, San Francisco, CA 94115; 800-322-1954 or 415-885-1689. Version 1.1. $159.

— Aileen Abernathy



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CIRCLE 29 ON READER SERVICE CARD.

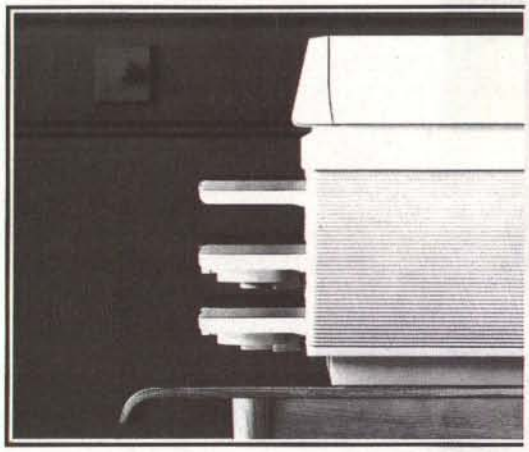
THIS SHOULD GIVE YOU OF WHY WE CREATED A

The image you see over there started out attached to the image you see over here. But as this document made its way down to the printer, the Macintosh it was created on recognized a small problem: 11 x 17 pages can't fit through 8½ x 11 printers.

And so, out came the electronic scissors.

Now, if you're like many Macintosh users, you know all about this routine. And you know how it feels to walk into a meeting with a layout that contains hours of blood, sweat and tears, and a fat strip of tape right down the middle. Enough said.

Introducing the new COMPAQ PAGEMARQ Laser Printers. A line of machines that can print 11 x 17 pages in a single pass. And because they come with up to three paper trays, these printers also let you switch between paper sizes without ever leaving your desk. So you don't have to pull one paper tray out and replace it with another, only to have your neighbor repeat the process two minutes later. And for



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A PRETTY GOOD IDEA
11 x 17 LASER PRINTER.

people whose design ambitions extend beyond Helvetica Bold, PAGEMARQ Printers offer two ways to expand your type library, eliminating the need to

continually download from your Macintosh. You can add 1- and 2-MB Programmable Font Modules, and store as many as 40 additional fonts. Or you can add an internal 60-MB Hard Drive, and store everything from Avant Garde to Zapf Chancery—as many as 1,500 fonts.

All of which print with amazing clarity thanks to the 800 x 400 dpi high-resolution mode—a feature that delivers razor-sharp type and graphics as well as smooth, high-definition gray scales.

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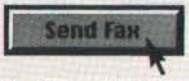
If you're interested in learning more, simply call 1-800-345-1518 in either the United States or Canada.

We'll show you how to keep your big ideas in one piece. At least until your client sees them.

A typographer's dream, these printers can store 1,500 fonts. Of course, not all of us dream about type. In which case, the 35 fonts that come standard are more than adequate.



Add an Internal FAX Modem and you can turn your Mac into a personal fax machine. One that will send and receive PostScript quality faxes in any size up to 11x17.

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CIRCLE 180 ON READER SERVICE CARD.

EXPERIENCE
BUDDY MILES EXPRESS
JULIO VALENZUELA
QMS ColorScript
LASER 1000
LETTER

LIGHT Colors

Desktop color laser printing is here. The QMS ColorScript Laser 1000 is the first of a new breed.

QMS was the first company to bring a color PostScript printer to the desktop market. The original thermal-wax ColorScript Model 30, which chugged away at a stunning one page per minute, first shipped in 1988. It produced grainy-looking color graphics and type, its consumables (a four-color wax ribbon) were expensive, it required special paper, and it had virtually no color-matching capabilities. And it boasted a stratospheric price tag: $24,995.

In just five years, desktop color printing has undergone a total transformation. But the color technology everyone's been waiting for is laser. The problem has been finding an engine that could produce good-quality output at an affordable price. The technical challenge of producing a four-color laser-generated image with accurate registration and consistent color has proved extremely difficult (see the "How It Works: The QMS ColorScript Laser 1000 Engine" sidebar).

With the ColorScript Laser 1000, QMS thinks it's found the magic color laser engine. Based on our testing of a preproduction unit (tested in May) and given the ColorScript Laser 1000's hefty list price of around $12,500, however, we think the question is still open.

Color for Business

The ColorScript Laser 1000 is not meant for everyone. It's intended as a business printer for people who want to put a bit of color in their otherwise gray documents. Anyone who is contemplating the purchase of a business printer has to be aware of several considerations, though.

The first is the cost of consumables. Unlike

BY HENRY BORTMAN

PHOTOGRAPHY: PIERRE-YVES GOAVEC POSTER: © 1968 BILL GRAHAM #140 ARTISTS: RICK GRIFFIN & VICTOR MOSCOSO

The ColorScript's printing costs increase as you add color to a page.

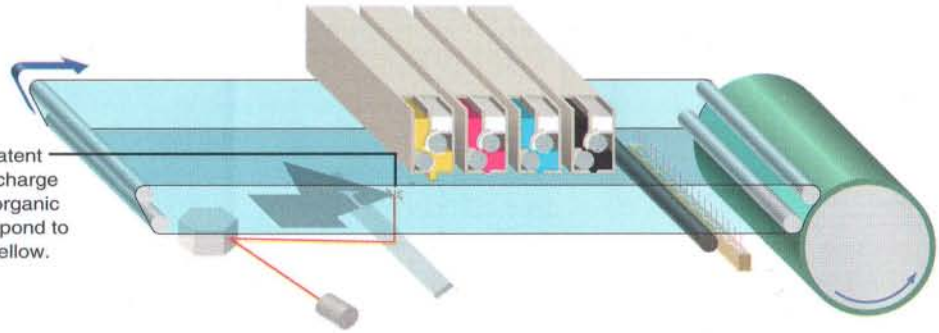
thermal-wax and dye-sublimation printers, which have a high cost per page regardless of the image printed, color laser printers should be cost-effective for monochrome as well as for color output (see Figure 1). Thermal-wax-printer output costs around 50 cents per page — including the cost of special paper — no matter whether the printers are used to print a full-color page or spot color. QMS estimates the price per page of printing a black-and-white document on the ColorScript Laser 1000 at a little less than 4 cents, only a penny higher than the cost of printing the same page on a monochrome laser printer. However, the ColorScript Laser 1000's printing costs increase as you add more color to a page. A full-color page, the kind you'd expect to see in a typical presentation, can cost as much or more to print on a ColorScript Laser 1000 as on a thermal-wax printer.

The second consideration is speed. With a page that contains only black (or gray-scale) text and graphics, QMS claims that the eight-page-per-minute engine in the ColorScript Laser 1000 enables it to print as quickly as a standard 300-dpi monochrome laser printer. (The unit we tested contained beta ROMs that had not yet been optimized for speed, so we were unable to verify this claim.) When you're printing a four-color page, the ColorScript Laser 1000's speed is comparable to that of thermal-wax and the fastest of the color inkjet printers: around *two* pages per minute.

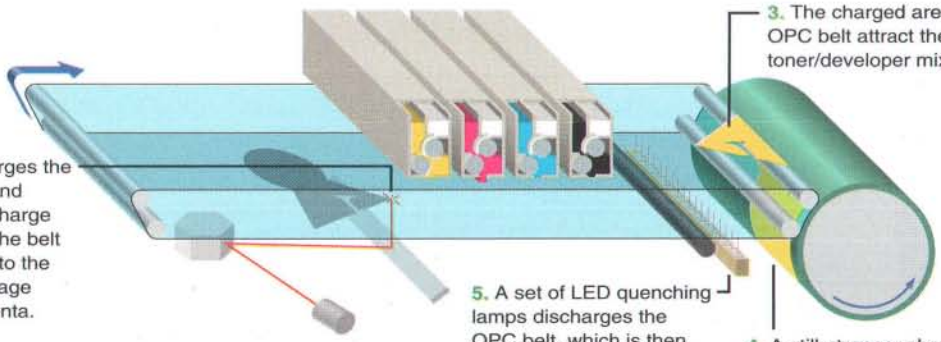
The third aspect of printing to take into account is print quality. Although seeing a full-color page come out of a laser printer is

How It Works: The QMS ColorScript Laser 1000 Engine

1. The PostScript RIP (raster-image processor) inside the ColorScript Laser 1000 stores a series of four color-separated images — one each for cyan, magenta, yellow, and black — in the printer's memory.



2. The printer's laser places a "latent image" — actually an electrical charge — on those areas of the OPC (organic photoconductor) belt that correspond to areas of the page that contain yellow.



3. The charged areas of the OPC belt attract the yellow toner/developer mixture.

4. A still-stronger charge on the transfer drum attracts the yellow toner from the OPC belt to the transfer drum.

5. A set of LED quenching lamps discharges the OPC belt, which is then scraped clean of any remaining yellow toner.

6. The laser charges the OPC belt a second time, placing a charge on the areas of the belt that correspond to the portions of the page containing magenta.

Figure 1: Cost per Page*

Figure 1: Color laser printers are cost-effective for everyday business use with pages containing black only or those with limited color coverage, but they're costly when printing pages with heavy color coverage. The cost of thermal-wax consumables is consistently high, regardless of what's on the page. Although the costs of color inkjet printing compare favorably with those of color laser printing, other shortcomings make inkjet printers impractical for everyday business use.

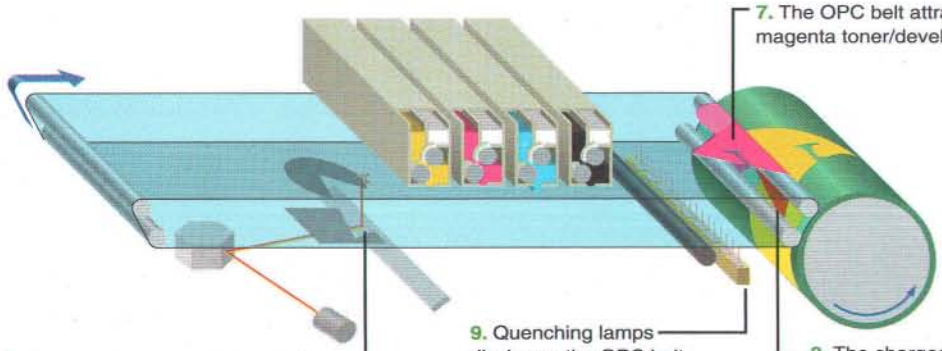
	Black text only	Black text with spot color	Full-color page
QMS ColorScript Laser 1000 (color laser)†	3.8 cents	6.75 cents	83 cents
Tektronix Phaser II PXi (color thermal-wax)§	22.5 cents	50.3 cents	50.3 cents
Hewlett-Packard DeskJet 1200C/PS (color inkjet)	2 cents	4.3 cents	49 cents
Apple LaserWriter IINTX (monochrome laser)	3 cents	NA	NA

*Based on manufacturers' estimates for an 8½-x-11-inch page.

†Estimates for the QMS ColorScript Laser 1000 are provisional.

§Price includes 7 cents for special paper.

The ColorScript's text looks like text from a 300-dpi laser printer.

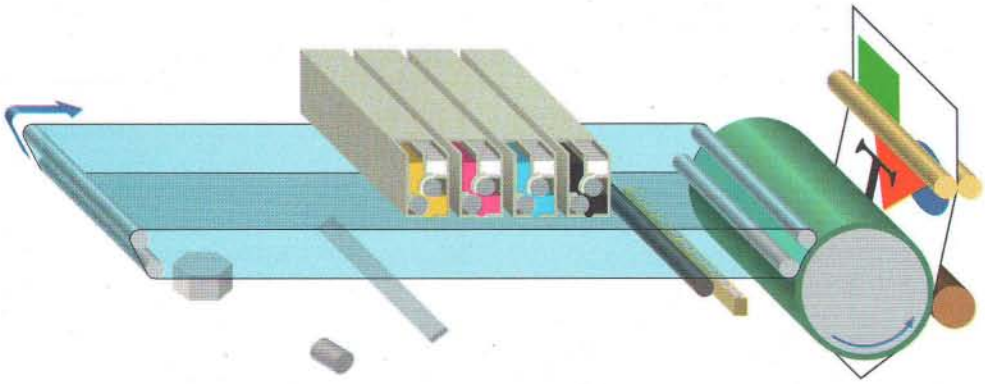


7. The OPC belt attracts the magenta toner/developer.

8. The charged transfer belt attracts the magenta toner from the OPC. It is deposited on the transfer drum on top of the yellow toner.

9. Quenching lamps discharge the OPC belt, and a scraper cleans off the remaining magenta toner.

10. The same process is repeated for cyan and then for black. When all these steps have been completed, the entire four-color image is present on the transfer drum.



11. The printer feeds paper past the transfer drum. A corona wire applies a "separation" charge to the back of the paper, which attracts the toner from the transfer drum to the paper. The fusing assembly uses a combination of heat and pressure to melt the toner onto the paper.

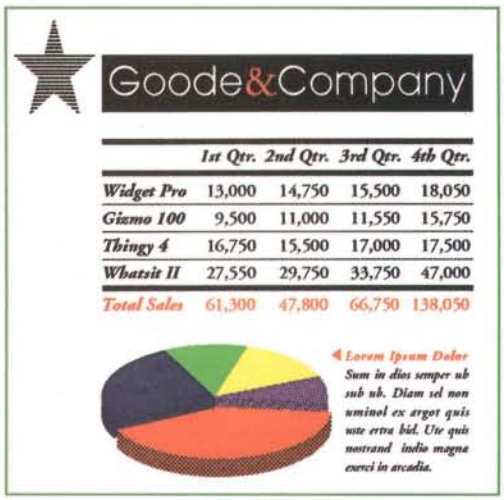
The ColorScript's output is as durable as monochrome laser output.

impressive, based on our test samples, color laser technology has a way to go (see Figure 2). QMS says it's still working on the halftoning algorithms for the ColorScript Laser 1000, which is good, because the color images we printed reminded us of the graininess and banding apparent in the output of the early thermal-wax printers. The ColorScript Laser 1000's output was also the least saturated (the dullest) of all the printer output we examined for this report. Text quality was another area in which we were less than overwhelmed. Today's monochrome laser printers are adopting resolution-enhanced 300 dpi and even 600 dpi as standard resolutions, but the ColorScript Laser 1000 has only a plain-vanilla 300-dpi engine. Although the ColorScript Laser 1000's text output is equivalent to that of an unenhanced 300-dpi monochrome laser printer, such as the Apple LaserWriter IINTX, Tektronix's color thermal-wax Phaser II PXi produced text of nearly equal quality. Surprisingly, what impressed us the most in the text samples was the output from the Hewlett-Packard DeskJet 1200C/PS color inkjet printer (see Figure 3).

The fourth consideration is durability. Thermal-wax printers and phase-change (crayon-jet) printers, such as the Tektronix Phaser III PXi, are notorious for producing pages that can be easily scratched or that flake in the course of normal handling. Pages printed by inkjet printers are prone to smearing when they get wet. The ColorScript Laser 1000, on the other hand, outputs documents that are every bit as durable as those produced by monochrome laser printers (see Figure 4).

The final consideration is duty cycle. One of the main reasons business users have settled on laser printers for monochrome printing is that laser engines can produce thousands of pages per month. The ColorScript Laser 1000's engine is rated at 5,000 pages per month. Color printers based on other printing technologies aren't likely to hold up well under such heavy use.

Figure 2: Real Results



Goode&Company

	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Widget Pro	13,000	14,750	15,500	18,050
Gizmo 100	9,500	11,000	11,550	15,750
Thingy 4	16,750	15,500	17,000	17,500
Whatsit II	27,550	29,750	33,750	47,000
Total Sales	61,300	47,800	66,750	138,050

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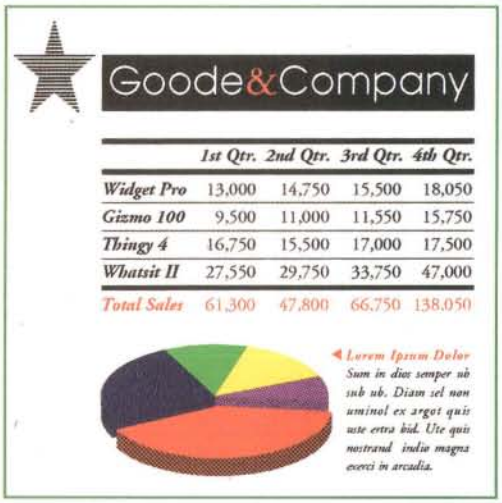
QMS ColorScript Laser 1000 (color laser)



Goode&Company

	1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Widget Pro	13,000	14,750	15,500	18,050
Gizmo 100	9,500	11,000	11,550	15,750
Thingy 4	16,750	15,500	17,000	17,500
Whatsit II	27,550	29,750	33,750	47,000
Total Sales	61,300	47,800	66,750	138,050

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Tektronix Phaser II PXi (color thermal-wax)

Figure 2: The QMS ColorScript Laser 1000 can theoretically produce crisper text at small point sizes and when imaging hairline (.25 point thick) rules, but we noticed in the samples we printed that type from the ColorScript Laser 1000 (top) appeared a bit on the fat side, whereas type from the Tektronix Phaser II PXi (bottom) was somewhat ragged. As for colors, even without the use of the color-rendering dictionaries that will ship with the ColorScript Laser 1000, the printer's colors appeared more accurate than those of the Phaser II PXi. The Phaser II PXi's colors were more saturated, however.

Color Negatives

The ColorScript Laser 1000 does have some shortcomings. One is inconsistency. Although the printer ships with three color-rendering dictionaries, each optimized for printing a different kind of document, the color accuracy is far from adequate for prepress color proofing. It's even an open question whether the ColorScript Laser 1000 is capable of producing color that's consistent enough to satisfy demanding business users. When we ran several copies of the same page through our beta printer, we could see noticeable

differences in the colors from one printout to the next.

Another negative is the ColorScript Laser 1000's price. Twelve and a half grand is way up there. Color PostScript thermal-wax printers, specifically the Tektronix Phaser 200e, can be had for as little as $3,659 these days. Color PostScript inkjet printers are even less expensive — the Hewlett-Packard DeskJet 1200C/PS lists for $2,399. Even the prices of dye-sublimation printers, such as the Kodak ColorEase PS, have dropped as low as $7,999. If color laser printers are to become truly mainstream, their prices will have to come down too.

And you couldn't exactly say that the ColorScript Laser 1000 is the easiest printer in the world to maintain. Each of the four colors has a developer cradle and a toner cartridge. That's a grand total of eight containers of messy stuff to handle.

But Is It PostScript?

The ColorScript Laser 1000 doesn't use an Adobe PostScript controller, but QMS claims that its Crown controller is fully compatible with PostScript Level 2. The ColorScript Laser 1000 implements QMS' versions of both PostScript Level 1 and PostScript Level 2 plus Hewlett-Packard's PCL 5c.

Crown technology also supports the spooling of multipage jobs to disk. The ColorScript Laser 1000 controller board contains an on-board 40-megabyte hard-disk drive and can support additional external hard drives if necessary. Spooling isn't possible with printers that have Adobe PostScript controllers.

For networking, the ColorScript Laser 1000 comes standard with LocalTalk and parallel ports and has an optional expansion slot for an Ethernet or token-ring interface. These cards are available with support for a variety of network protocols, including EtherTalk. In the past, however, some QMS printers with Crown controllers have been less than robust when it comes to network interfaces, exhibiting a tendency to come and go on the network arbitrarily.

A Colorful Future?

Because QMS' new printer was still in beta at press time, it was too early for us to give it a full evaluation. It remains an open question whether the ColorScript Laser 1000, with its consistency problems and its $12,500 price tag, will catch on. But as the first out of the gate, the ColorScript Laser 1000 has launched a new era.

When he's not formulating the perfect PowerBook, *MacUser* technical director Henry Bortman spends part of his time imagining the perfect color printer.

For color laser printers to become mainstream, their prices must drop.

Figure 3: Text Up Close

Sum in dios semper ub sub ub. Diam sel non

QMS ColorScript Laser 1000 (color laser)

Sum in dios semper ub sub ub. Diam sel non

Tektronix Phaser II PXi (color thermal-wax)

Sum in dios semper ub sub ub. Diam sel non

Apple LaserWriter IINTX (monochrome laser)

Sum in dios semper ub sub ub. Diam sel non

Hewlett-Packard DeskJet 1200C/PS (color inkjet)

Figure 3: We used our four test printers to print 6-point black Adobe Garamond Italic type and enlarged the output 300 percent. As we expected, the ColorScript Laser 1000 and the Apple LaserWriter IINTX produced text of roughly equal quality. However, the Tektronix Phaser II PXi did almost as well. Surprisingly, Hewlett-Packard's new color inkjet printer, the DeskJet 1200C/PS, was our favorite in this comparison.

Figure 4: Handle with Care?

SCRATCH SMEAR

QMS ColorScript Laser 1000 (color laser)

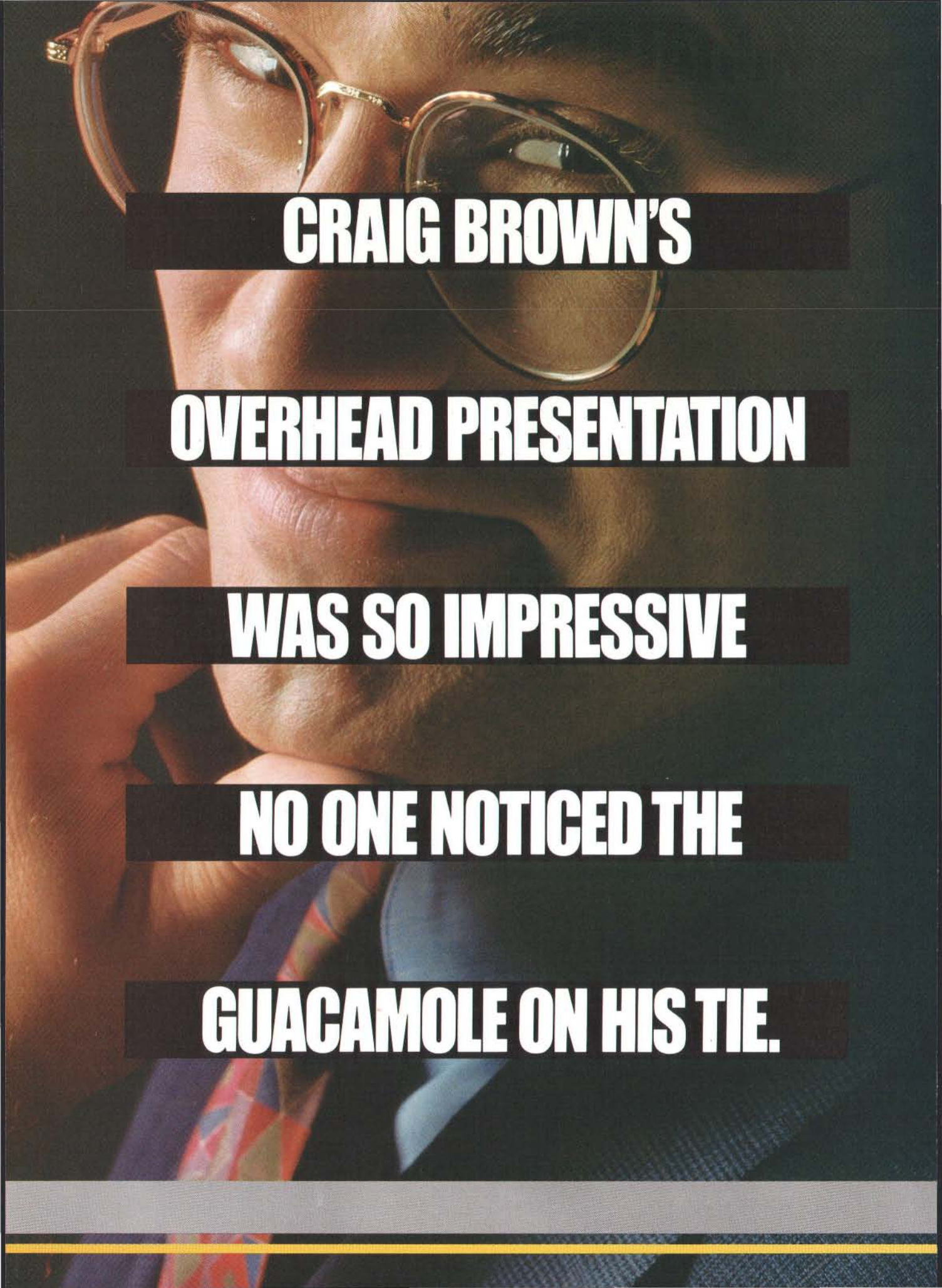
SCRATCH SMEAR

Tektronix Phaser II PXi (color thermal-wax)

SCRATCH SMEAR

Hewlett-Packard DeskJet 1200C/PS (color inkjet)

Figure 4: Color laser output holds up well in the face of scuffs and smears that can occur when pages are creased or get wet. Thermal-wax-printer output, however, is prone to scratching and flaking and inkjet output to streaking and smearing. We took a fingernail (scratch) and a wet fingertip (smear) to printouts from three of the printers to see how they held up.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MOVIE *Magic*

QuickTime goes big time with Hollywood-class special effects.

BY DAVID BIEDNY

A monster towers over a terrified city; a caped crime fighter jets through the night to thwart a cadre of death-dealing waterfowl; an all-too-human gumshoe tails gun-toting rodents in a talking taxicab: The illusions are so convincing that we gladly go along for the ride.

PHOTOGRAPHY: TOM UPTON

Filmmakers have long used high-tech effects to make us believe the impossible, but such magic tricks are no longer the sole domain of Hollywood. Mac movie moguls can now use these silver-screen techniques to enliven their QuickTime productions.

The main difference between QuickTime special effects and their big-screen counterparts is that QuickTime tools are much more affordable and accessible. So much so, in fact, that many big players in the film world have begun to use QuickTime as a cost-effective way to try out special effects.

The main contenders in the QuickTime special-effects category are VideoFusion and After Effects. Serious QuickTime moviemakers will want to own both.

Several QuickTime special-effects programs have appeared in the last year, boasting a sophistication that has surprised even jaded digital-movie mavens. The two main contenders in this category are VideoFusion and After Effects. It's important to note that neither VideoFusion nor After Effects takes the place of an all-purpose movie editor such as Adobe Premiere or DiVA's VideoShop (see the "QuickTime Editing Tools Gain Power" sidebar). Premiere contains a variety of special-effects tools in its generous collection of video-editing features, but advanced effects require more-refined and more-specific instruments. VideoFusion and After Effects each provide such tools, and although their abilities overlap to some extent, each program offers unique advantages. Serious QuickTime moviemakers will find reasons to own both.

Basic Approach

QuickTime special effects can be divided into several general categories: compositing, filtering, image warping, motion control, and channel manipulation.

Both VideoFusion and After Effects offer tools for these tasks, but each program approaches the tasks differently. VideoFusion is a bit easier to learn and offers unique color-manipulation tools; After Effects combines a powerful object-oriented approach with multiple keyframes for all effects. After Effects lets users layer QuickTime movies, animation sequences, and still images while retaining control over each discrete element. Don't underestimate this object-oriented approach — once you get used to it, you'll wonder why still-image-processing programs haven't adopted it.

VideoFusion is mainly useful for QuickTimers making movies for playback on a Mac. After Effects, with abilities such as field rendering, which maximizes video quality in QuickTime-output transfer to videotape, will appeal to higher-end video producers. After Effects renders all effects at a subpixel resolution, for extremely smooth motion and filtering. (Rendering is the application of effects, filters, or composite images to a movie.)

Down to Business

VideoFusion and After Effects can each import and export a variety of data types in addition to QuickTime movies: Both programs support the standard QuickTime

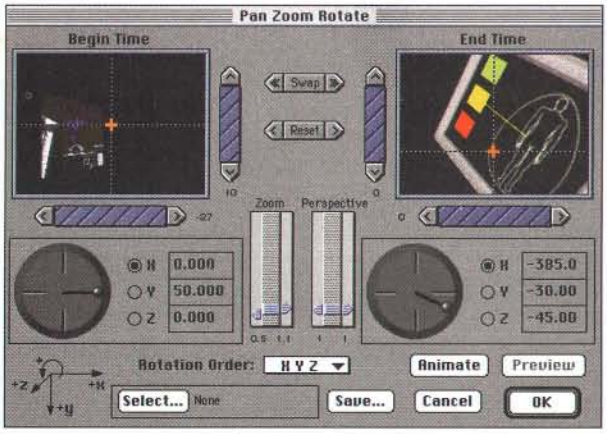


Figure 1: VideoFusion's Pan Zoom Rotate screen, which uses sliders and a joysticklike control to guide movie motion within a frame, is typical of the program's intuitive interface.

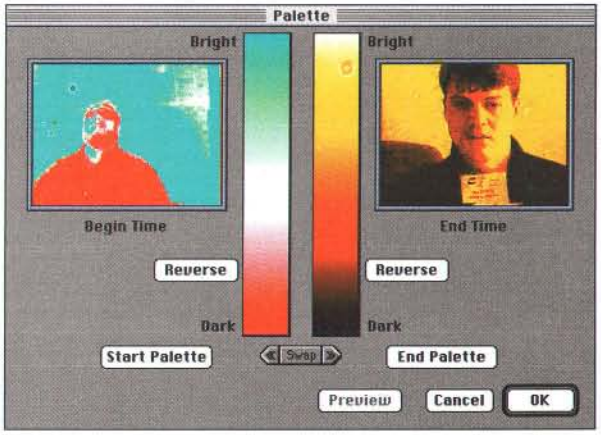
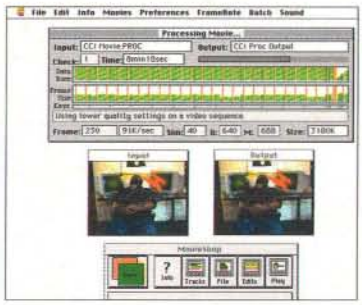


Figure 2: VideoFusion's Palette controls make it easy to colorize QuickTime movies and enable users to change the coloring of an image gradually.

MovieShop: Sync's a Cinch

One of the best-kept secrets of the professional-QuickTime-authoring world is a small but powerful utility included on the CD-ROMs Apple distributes to QuickTime developers. The program, MovieShop, has the awesome ability to process a QuickTime movie in a way that rearranges the video and audio data for maximum playback performance from slow-access media (namely, CD-ROM). MovieShop greatly reduces the synchronization problems that plague even the most carefully digitized movie.

Simply put, MovieShop processes and organizes QuickTime movies so that the audio and video tracks are intelligently *interleaved* — the audio is broken into small chunks and placed between slightly larger chunks of video data. This optimizes data flow so that when you're playing a movie back from a CD-ROM, the audio streams off the disc in conjunction with the video. This eliminates the annoyingly jerky synchronization that normally results when sound and video are captured in real time from videotape. MovieShop also offers controls for fine-tuning all QuickTime compression methods and reducing the data rate of a movie to match the data rate of a CD-ROM drive (even one as slow as the 90K per second provided by the earliest drives) and can be set to automatically batch-process a series of movies on-disc.



MovieShop, Apple's little-known QuickTime utility, lets you adjust the data rate and quality of a movie for optimal playback from slow media (such as CD-ROM). While it's processing, the program displays a readout of data flow, keyframes, and sound/movie interleaving.

Although MovieShop can be finicky (it has been known to crash for no good reason) and isn't readily accessible to nondevelopers, it's worth tracking down. As to when we'll see a streamlined, user-friendly, consumer version of this utility, are any developers reading this?

data formats: PICS, for animation; PICT, for still images; and AIFF (Audio Interchange File Format), for sound. VideoFusion can import sequences of PICT files and convert them directly into a QuickTime movie. (The export capability is especially useful for rotoscoping, an animation technique that involves painting on the individual frames of a movie. To rotoscope QuickTime movies, you must first export them to an image-editing program such as Photoshop.) After Effects can import PACo files (PACo is a multiplatform, 8-bit animation/digital-video file format developed by After Effects' maker, The Company of Science & Art [CoSA]).

Once you've imported your data, the real work begins. VideoFusion offers a variety of windows in which to organize data: The Storyboard view offers an intuitive way to organize video clips, and the Timeline window displays the contents of the Storyboard as clips arranged in a horizontal time view (much like the time line in Adobe Premiere). In VideoFusion, you place clips into the Storyboard and select them for processing. For processes that involve multiple movies — such as compositing and using arithmetic functions — you simply Shift-click to select multiple clips in the Storyboard window.

After Effects takes a different, slightly less intuitive approach: You can group movies and still images into a Project or combine them in a variety of ways as

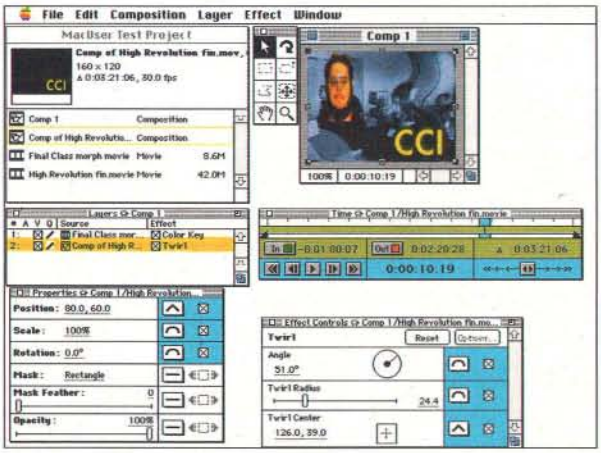


Figure 3: To inexperienced users, After Effects' interface is less than self-explanatory, but a bit of practice reveals the program's power and versatility.

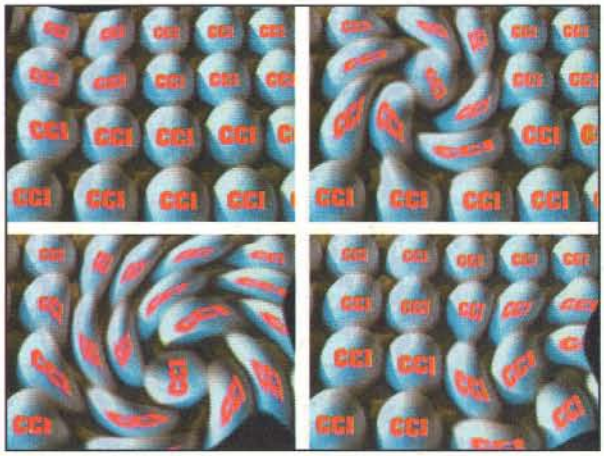


Figure 4: An animated twirl effect, available only in After Effects, makes QuickTime images putty in the hands of even novice users.

Compositions. You select elements of the Project as needed — one at a time or in combinations — for viewing and manipulating in the Composition window, which represents the completed movie frame. Once you have your elements in the Composition window, you can use interactive tools to scale, move, and rotate them. After Effects' object-oriented approach makes it easy to create *video walls,* lines that divide a frame or image into sections.

A clear advantage of After Effects soon becomes obvious: Whereas you must render effects one at a time in VideoFusion, After Effects allows you to specify multiple effects parameters for a video clip and then process them simultaneously. After Effects also lets you use multiple keyframes to control different effects: Keyframes, located at user-specified intervals in a QuickTime movie, are markers for synchronizing sound with video, starting and stopping transitions, and so on. With After Effects, in addition to specifying when given effects begin and end, you can set their characteristics and intensity at any interim keyframes. The program then interpolates the values between keyframes, which makes it easy to handle complex motion, fading, and filtering.

A dynamic morph requires significant planning and hard work, but the payoff is complex morphing sequences like those in movies such as Terminator 2.

VideoFusion doesn't currently offer multiple keyframes: Each effect has only start and stop settings. Although you *can* create complex motion and filtering effects with VideoFusion by breaking a video clip into segments, applying the desired effects, and reuniting the parts into a whole, it's a lot of work.

Another particularly attractive aspect of After Effects is that it supports multiple undo levels (given that you have a healthy amount of RAM — a reasonable assumption for advanced QuickTime aficionados). When you're rendering an effect in After Effects, the program presents you with a detailed progress screen that shows exactly which layers are being accessed and processed, a running total of the amount of time and disk space required to render and store the resulting movies, the type of QuickTime compression being used, and more. You can pause and continue rendering sessions at will, a feature you'll appreciate especially during lengthy effects processing.

Compositing

The most basic special-effects work involves compositing, the layering of two or more images (still, moving, or animated) to create a coherent whole. Users accustomed to combining images with Photoshop will find VideoFusion's tools intuitive. The drawback of the VideoFusion method is that the program can composite only two elements at once; complex composites of many elements require multiple, processor-intensive passes. In After Effects, you drag elements into the Composition window and arrange them; you can position and layer several elements at a time. You can preview After Effects composites in a choice of resolutions — lower resolutions update the screen more quickly but at the expense of visual accuracy. For final output, After Effects can render the entire composition at high quality in one pass. The object-oriented layering method, combined with an ability to change the softness and other edge characteristics of image masks (which protect a selected area of an image from alteration) over time, makes After Effects the compositing champ.

Filtering

Beyond controls for brightness, contrast, embossing, and color balance, After Effects and VideoFusion each offer their own selection of powerful filters (commands

QuickTime Editing Tools Gain Power

The two most popular programs for general QuickTime editing are Adobe Premiere and DiVA's VideoShop. The current version of Premiere, 2.0, sets the standard to beat. It offers a wonderfully robust set of editing tools, enough special-effects capabilities to satisfy most users, and support for integration with the higher-end video-editing world via EDLs (Edit Decision Lists). The ability to save movies in filmstrip format for rotoscoping in Photoshop rounds out the wonders of this QuickTime editor.

As of this writing, VideoShop was still stuck in version 1.0, constrained by the performance limitations of HyperCard (around which it's built). However, DiVA recently announced version 2.0, which has been rewritten from scratch and is no longer based on HyperCard. VideoShop 2.0 reportedly contains a long list of improved and new abilities, including better sound tools (sound handling in the current version is abysmal), finely tuned editing tools, and significantly expanded special-effects options. The company will also be releasing a lower-priced, much less sophisticated QuickTime editor for less demanding users. The recent acquisition of DiVA by digital-video giant Avid promises exciting new developments: Expect to see future versions of VideoShop offer closer integration with Avid's high-end video-editing systems. For now, though, Premiere is the most capable editor for all levels of sophistication.

that change the overall look and color of elements).

After Effects' many filter effects include beveled edges (which automatically chisel the edges of a movie or still image, with the added option of specifying — and animating — the direction of the light source), drop shadows, Gaussian blur (*very* important for creating advanced shadow effects), and noise (an important starting point for unusual textures).

But VideoFusion wins in the filtering category, due to the sheer number and extreme flexibility of its filters. Tinting, colorization, custom filters, and advanced Choke and Spread filters are just some of its offerings.

Image Warping

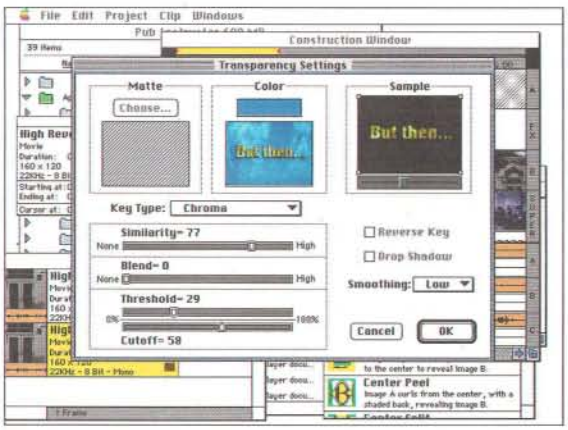
Image warping means altering the shape of an object or layer. VideoFusion and After Effects each offer a variety of practical, wacky, and downright wild warping and distortion effects.

After Effects' image-warping effects include animated ripple, polar coordinates, mirroring, and twirl. Creative animators will especially appreciate the more advanced controls that allow for such things as changing the center and diameter of twirling over time.

VideoFusion has a great mesh-warp effect, with built-in swirling and pinching. In mesh warping, an imaginary grid is superimposed over an image, allowing users to push, pull, or fold the image at one or more points on the grid. VideoFusion allows users to control individual points on the mesh, a technique that can generate complex animated-image distortion. VideoFusion is the only Mac program that offers keyframe-based morphing, the special effect that enables one image to transform smoothly into another, as in a car melting into a fighter jet. Unlike the more specialized Gryphon Morph, which creates morphs between still images, VideoFusion lets you morph dynamically between movie files. A successful dynamic morph requires significant planning and hard work, but the payoff is complex morphing sequences like those in Michael Jackson's "Black or White" music video and movies such as *Terminator 2*. If complex, dynamic morphing is important to you, VideoFusion is worth the price of admission for this feature alone.

Table 1: Pros and Cons of QuickTime Special-Effects Programs

	After Effects 1.0 ♣♣♣♣½	VideoFusion 1.0.1 ♣♣♣♣
List price	$1,295	$649
Pros	Can process many effects at once. Outstanding motion control. Object-oriented layering.	Relatively inexpensive. Intuitive interface. Excellent dynamic morphing. Numerous, flexible filters.
Cons	Nonintuitive interface. Timeline window limited to one element at a time.	Multiple effects must be applied one at a time. No multiple keyframes.
Company	The Company of Science & Art (CoSA) 14 Imperial Pl. Ste. 203 Providence, RI 02903 401-831-2672	VideoFusion Ltd. 1722 Indian Wood Cir. Ste. H Maumee, OH 43537 800-638-5253 419-891-1090



It lacks the breadth and flexibility of programs dedicated to QuickTime special effects, but Adobe Premiere offers an impressive selection of basic effects. Its compositing controls (called Transparency Settings in Premiere) are as powerful as those in any special-effects package.

Motion Control

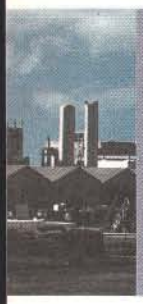
Motion control is an essential aspect of special-effects work: Moving elements around in 2-D and 3-D space is important for everything from rolling credits to flying vehicles. VideoFusion and After Effects each have good motion-control features. After Effects' multiple-keyframe ability is helpful for making complex, convincing motion, and the program's fine rendering resolution provides extremely smooth results. Another powerful After Effects feature is hierarchical motion linking: If you create a moon spinning around the earth, for example, you can link the two elements so that when you move the earth around, the orbiting moon tracks it. After Effects is one of the only Mac-based programs that offers this ability. VideoFusion lacks multiple keyframes and hierarchical linking and renders motion less smoothly than

After Effects does, but it has a better user interface, which makes it easier to use. One of the best components of VideoFusion's interface is a tool that lets you preview motion parameters in an animated wire-frame mode before you actually apply them.

(Adobe Premiere has a decent interface for complex, multiple-keyframe motion, but it is harder to use than the VideoFusion interface, and Premiere's output quality is not as good as that of After Effects. VideoShop, by contrast, currently offers only crude motion effects.)

Channel Manipulation

Interchannel-mathematics commands, which allow you to manipulate the RGB and alpha channels of video images separately and to combine them in a variety of ways, are important for achieving advanced special effects. For instance, you can add the red channel of one image to, subtract it from, or multiply it into the red channel of a second sequence — often with some surprising results. You can also remove color or brightness channels from a movie, manipulate them, and reinsert them into the movie. VideoFusion and After Effects each offer a healthy selection of interchannel-math effects, but After Effects' commands are slightly harder to use.



Both programs are impressive, given that they are among the first in what promises to be an ever-expanding universe of QuickTime effects tools.

Missing Sprockets

Although both VideoFusion and After Effects are capable special-effects generators, each is missing some important touches.

One of After Effects' main drawbacks is that its Timeline window displays the duration and status of just one element at a time — there is no way to look at the time lines of multiple elements simultaneously. The program's motion-control interface is somewhat crude as well. (After Effects 1.1, which was scheduled for release just as this article went to press, promises streamlined window management and several other ease-of-use enhancements.) VideoFusion lacks the multiple-keyframe flexibility and powerful object-oriented layering of its rival.

(By the time you read this, VideoFusion Ltd. expects to be shipping version 1.5, an upgrade that promises field rendering and several other enhancements aimed at professional video editors. Look for overall effects-processing acceleration, full-screen previews, the ability to control morphs field by field as well as frame by frame, and an NTSC-safe filter for optimizing color for videotape. The upgrade will be free to registered users.)

Both programs could use some form of acceleration: At higher resolutions (notably video resolution), processing slows dramatically. You should approach the process of effects rendering in these programs in the same way that you approach 3-D rendering: Set up your effects sequences during the day, and let your Mac process them at night. Both of the programs cry out for support of DSP (digital signal processing) hardware to accelerate demanding mathematical computations. VideoFusion 1.5 will address this issue with optional support for YARC Systems' RISC-based acceleration hardware.

Another significant omission from each of these programs is motion blur, which creates blurring based on the speed and direction of an element's motion. Motion blur adds an extra dimension of realism to artificial motion.

Both programs are also surprisingly weak when it comes to sound handling: Basic sound fading is about as extravagant as either of them gets, so plan to handle sound effects with your main video-editing program.

Last, but not least, the manuals for both VideoFusion and After Effects are on the light side. For example, VideoFusion's powerful arithmetic commands aren't really put into practical context in the manual, and After Effects' ability to link elements hierarchically isn't covered in sufficient detail.

The Bottom Line

VideoFusion and After Effects are both capable special-effects tools for QuickTime production. VideoFusion is a less expensive program and offers outstanding filtering effects, advanced dynamic morphing, and nice interface touches. After Effects is a powerful, higher-end special-effects generator geared toward professionals looking for broadcast-quality output, and it has a considerably higher price tag to match.

Although some aspects of each program could stand improvement, both programs are impressive, considering that they are among the first in what promises to be an ever-expanding universe of QuickTime special-effects tools.

David Biedny is a digital artist and multimedia educator. At Industrial Light and Magic, he used QuickTime while producing special effects for movies including *Terminator 2, The Rocketeer, Memoirs of an Invisible Man,* and *Hook.*

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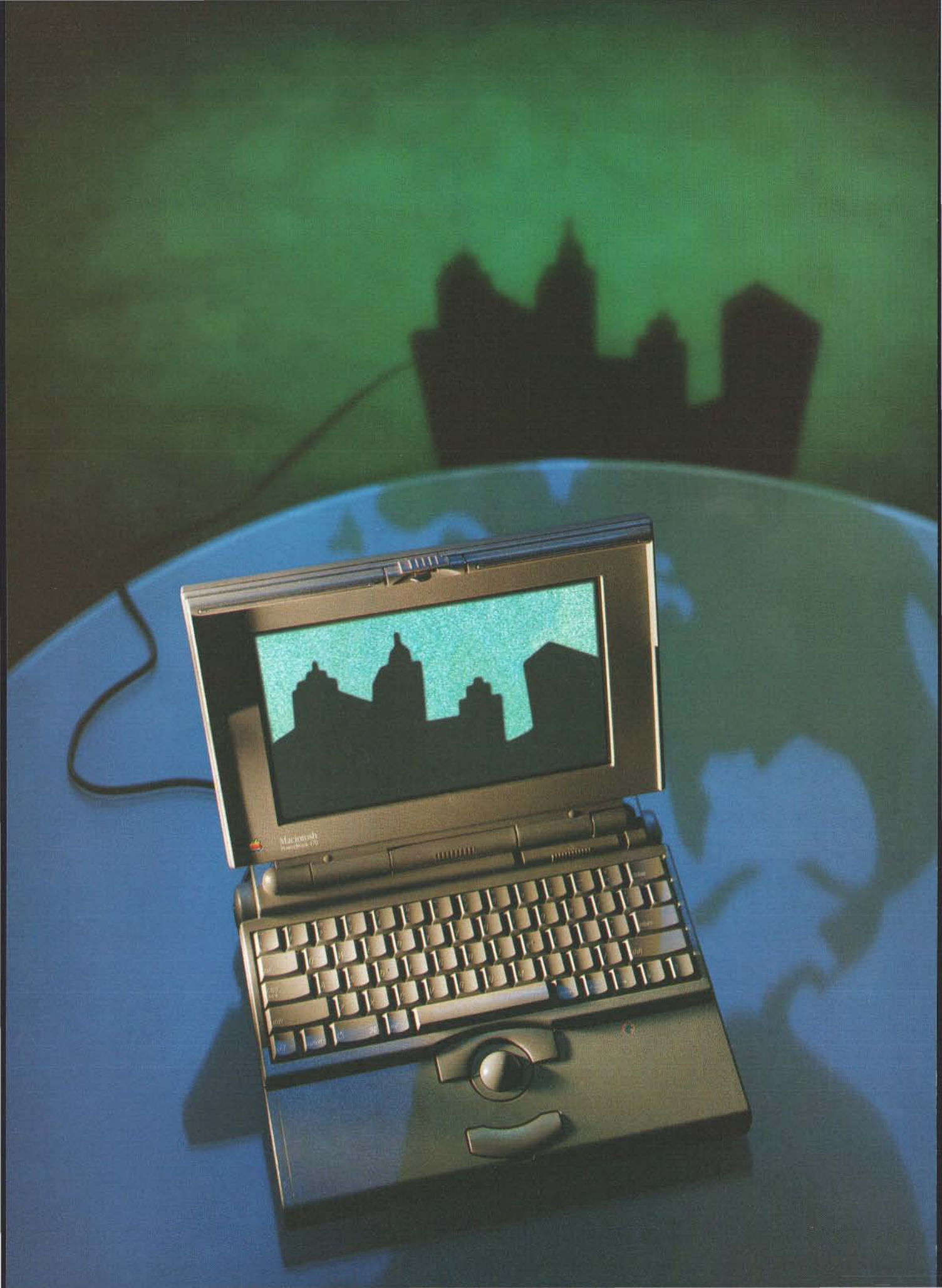
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BY OWEN W. LINZMAYER

PowerBooks give you the freedom to compute where you want, when you want. Still, there are going to be times when you need the assistance of other computers. Fortunately, help is just a few keystrokes away when your PowerBook is equipped with an affordable, high-speed modem.

A modem allows your PowerBook to remotely access your office network, exchange electronic mail, download software from bulletin-board systems, search on-line databases, and trade faxes around the world. Some even transform your PowerBook into a full-featured phone or translate faxed messages into editable text. Quite simply, a PowerBook without a modem doesn't live up to its name.

To help you choose the ideal PowerBook modem (short for *modulator/demodulator,* a device that lets digital computers talk to each other over analog telephone lines), we rounded up a batch of ten high-speed internal models. Just a year or two ago, *high-speed* meant that the modem was capable of transmitting a maximum of 9,600 bps (bits per second). Today's high-speed models have a top speed of 14.4 kbps (kilobits per second) and employ data-compression schemes that can raise their effective throughput to well above that already heady level.

If you want to stay a step ahead of obsolescence while enjoying the money-saving benefits of top-speed telecommunications, we recommend that you pony up for a 14.4-kbps modem. The difference in price is minimal: Although today's high-speed modems are as much as 50 percent faster, they cost only 15 percent more, on average, than their slower siblings. You can tell that a modem is capable of 14.4 kbps if it is labeled *V.32bis* — an international standard that defines speed and other capabilities. Don't confuse this with the slower, 9,600-bps *V.32* standard.

Nine of the modems we tested fit inside the PowerBook 140, 145, 160, 165c, 170, and 180. Sadly, none fits inside the venerable PowerBook 100. Only one — the Apple PowerBook Express Modem — fits inside the PowerBook Duo 210 and 230 (an Express Modem that fits inside the PowerBook 160 and 180 is also planned). The Express Modem differs in one other important way: It requires the Duo's 68030 microprocessor to perform data-manipulation tasks that are handled by hardware built directly in to the other nine modems. This design economy gives the Express Modem a low price and enables it to fit within the tight confines of the Duo, but as we discovered, it hampers its performance (see Figure 1).

To achieve the speed of 14.4 kbps, the modems at both ends of the connection must conform to the V.32bis standard. Therefore, if you plan to use your PowerBook to log in to your office's network, using ARA (AppleTalk Remote Access) or Farallon's Timbuktu/Remote, make sure the network modem supports V.32bis also or you won't be communicating at top speed (see the "In the Office" sidebar for tips on setting up an ARA network to receive incoming calls). Unfortunately, most major commercial information services (America Online, AppleLink, CompuServe, and GEnie) do not yet support V.32bis. But that doesn't mean you can't access these services: Part of the V.32bis standard ensures that your modem falls back to the highest speed possible, and in most cases, that means 9,600 bps.

Because they have serial ports, all PowerBooks are capable of using external high-speed modems. However, the internal modems we tested are more attractive in terms of price and convenience. With an average street price around $350, a V.32bis internal modem is cheaper than most comparable external modems (see the "On Their Own" sidebar). And because these tiny internal modems draw power from the motherboard, you don't need to lug around bulky power supplies and cumbersome cables or worry about yet another battery running down; there's little to lose except all that extra weight.

At a Glance

▶ Apple PowerBook Express Modem	★★★½
Applied Engineering DataLink PB	★★★
APS Modem 14.4	★★★
Data Race RediModem V.32bis/FAX	★½
Dtronix PowerAccess 144/144	★★½
▶ Global Village PowerPort/Gold	★★★★½
MacProducts Magic AFX-PB 14.4	★★★
Piiceon PowerBook Dispatcher	★★★
▶ Prometheus ProModem 144i	★★★★
PSI PowerModem IV	★★★½

▶ *MacUser* Bottom Line pick

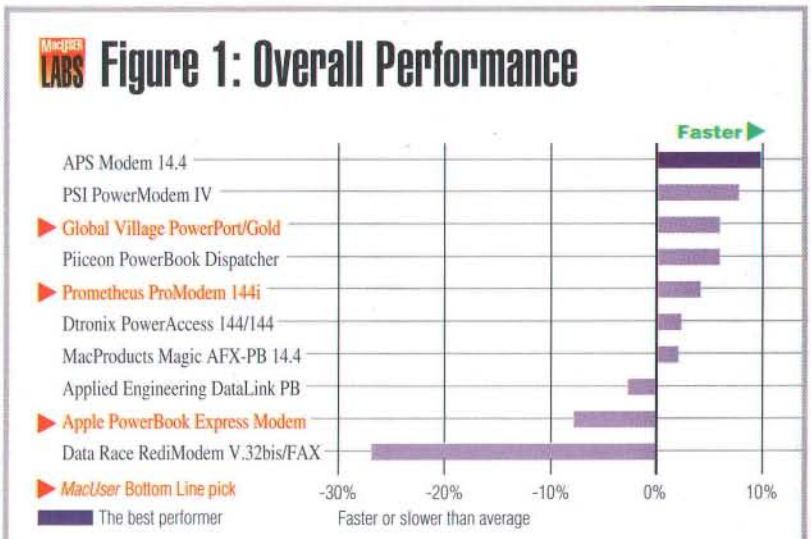


Figure 1: High-speed, internal PowerBook modems are consistently fast, by and large. When we combined reams of data from a whole battery of tests into one overall ranking for each modem, we discovered that only one V.32bis modem — the Data Race RediModem V.32bis/FAX — was significantly slower than the others. Such consistent performance means that you should choose your modem based on software, service, warranty, company reputation, and — of course — price.

Leave the installation to a certified technician if you are hesitant to pop open your PowerBook.

However, you might consider buying an external modem if you need to share a modem with others (see "Bargain Speedsters: V.32bis Modems," November '92, page 176) or if you want to swap one between your PowerBook and your desktop Macintosh.

Office in a Box

Unlike some of the earliest PowerBook modems, which required little boxes crammed with necessary circuitry hanging off the PowerBook's back panel, all ten modems we tested for this report are completely internal to the PowerBook and add no perceivable weight. According to Apple, if an internal modem is installed by someone besides an authorized Apple dealer, your PowerBook's warranty is void. Most vendors supply detailed instructions so that a PowerBook-savvy user with the necessary tools — T10 and T9 Torx wrenches plus a Phillips-head screwdriver — can do the installation in less than five minutes. However, we recommend that you leave the installation to a certified technician if you are the least bit hesitant to pop open your PowerBook.

Only the Applied Engineering DataLink PB is troublesome to install. Its unique two-way voice capability requires solder connections to the PowerBook's delicate motherboard, and the additional voice-management hardware in early models

In the Office

Preparing your PowerBook for an out-of-the-office experience is only part of the remote-connectivity equation — if things aren't set up properly at the office, there won't be much for you to connect to. Here are five things to consider if you want to provide the best possible setup for PowerBook-equipped travelers dialing in from afar:

Buy the best:

Don't pinch pennies. Equip your office network with the best modems you can afford. These modems are the crucial link between all your remote users and their data; pinching pennies here can easily cost you time and result in hassles later if things don't work. Favor reliability over low price.

Go high-speed:

Get modems based on the fastest standard possible — today's champ at 14.4 kbps is V.32bis. Support for a commonly used standard is critical: If you get modems that use proprietary high-speed schemes, only users with similar modems will be able to benefit.

Use the right CCL file:

If you're using ARA (AppleTalk Remote Access), make sure you have the correct CCL (connection control language) file for your modem. The CCL file contains necessary modem-configuration information, so a wrong or badly written CCL file can turn ARA into a support nightmare.

Set up your modems properly:

If you allow non-ARA dial-in — such as via QuickMail Remote — turn on your dial-in modems' error correction and compression. Most remote communication is text-based E-mail — if you're not using ARA (which handles its own compression), enabling error correction and compression will increase both reliability and throughput for dial-in users.

Exploit economies of scale:

Analyze how many dial-in users you have, how frequently they dial in, and what data they need to access. The most inexpensive ARA server today costs less than a cheap Mac running ARA, and setting up an ARA server is probably less expensive than installing an equivalent Mac-based setup.

However, if all your users want to do is access E-mail, using ARA may be overkill; installing such software as QuickMail Remote on your QuickMail server is often far more sensible and cheaper to implement.

— Stephan Somogyi

ILLUSTRATION: JACK MORTENSBAK

made it so large that the PowerBook case couldn't close properly. Applied Engineering has since reduced the size of the DataLink PB so that it fits better.

Once an internal modem has been installed, your PowerBook sports a modular *RJ-11 jack* — the same kind used to connect to most standard telephone lines in North America and Japan (see the "In the Hotel" sidebar for tips on using your PowerBook modem in your hotel room and the "Off the Hook" sidebar for information on using cellular devices). If your PowerBook will accompany you somewhere else in the world, we recommend that you wait until you reach your destination, search out an office- or electronics-supply store, and pick up the necessary adapter for that country's phone system.

After installing each modem, we measured its data and fax speed by using several phone-line simulators and impairment generators to create clean as well as noisy phone lines (see the "How We Tested PowerBook Modems" sidebar). We discovered that although speed is certainly important, you should also consider many other factors when choosing a PowerBook modem: the quality of the bundled software, ease of use, length of warranty, and availability of accurate and timely technical support.

How Fast Is Fast?

Since it was introduced with the original PowerBooks back in October 1991, ARA has proved to be an indispensable tool for anyone who needs to tap into network resources while on the road. Despite ARA's popularity, however, not every vendor includes the necessary CCL — connection control language — file that allows the modem to work with ARA without configuration problems. With the correct CCL file, a

MacUser LABS How We Tested PowerBook Modems

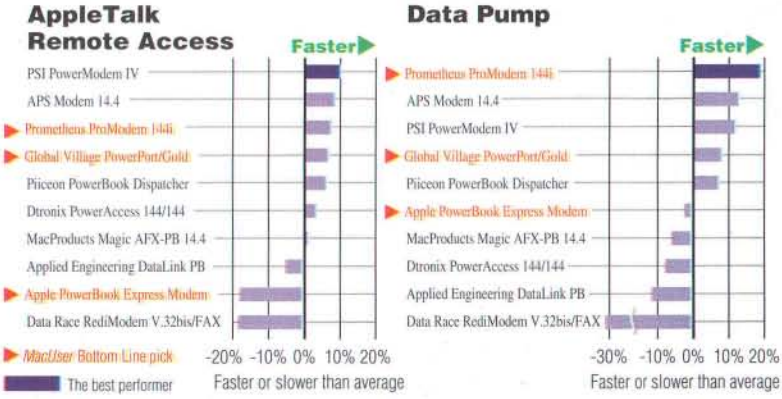
No modem is an island — a modem can't work alone. In addition to a modem or a fax machine on the receiving end, a high-speed PowerBook modem requires the services of the phone company or a long-distance carrier to keep you in touch with your office, your home, and your clients. Likewise, testing a modem requires both a receiving modem and a phone-wire connection.

Choosing a modem with which to test our PowerBook modems was easy: We used a Practical Peripherals PM-14400FXSA V.32bis fax/data modem, a Bottom Line pick in our November '92 report on desktop V.32bis modems. The PM14400FXSA is fast and reliable and as adept at receiving faxes as data — a worthy companion to the V.32bis internal PowerBook modems we tested for this report.

Setting up the right phone connections for testing wasn't as simple. When you're in a hotel room and you ask your PowerBook to link up with your office network, you have no control over the quality of the phone connection. You might be lucky and get a clean, fiber-optic link to the local phone-company switch right next to your office, or you might be unlucky and get an echo-filled satellite connection. Of course, there are also a myriad of possibilities in between, each with its own collection of *impairments* — hisses, pops, static, and just plain noise — each guaranteed to confuse your modem. In general, the poorer the quality of your phone connection, the more trouble your modem will have and the slower data transfer will be.

To simulate the challenges your modem will face when connecting to your office, we used a *telephone-network simulator* from Processing Telecomm Technologies, which can be set up to mimic a broad range of impairments. Simply put, each PowerBook modem we tested, when connected to the

Although different modems excelled in different tests, all performed similarly, with a few standouts in the data-pump and QuickMail Remote testing. Only the Data Race RediModem V.32bis/FAX turned in consistently disappointing times — as much as a full 40 percent below average when faxing. When sending a fax, the Dtronix PowerAccess 144/144 was unable to connect to our receiving modem, a Practical Peripherals PM14400FXSA; its fax performance is thus not shown.



Since it was introduced with the original PowerBook, ARA has proved to be an indispensable tool.

simple double-click is all it takes for your PowerBook to turn on the modem, dial a phone number, log on to a network, and mount an AppleShare volume.

Once you're connected, ARA gives you access to all the network services available to anyone back at the office — your PowerBook is, in fact, just another Mac on the network. Whether you hook up to your office through a modem attached to your desktop Mac, through a modem-equipped Mac dedicated as an ARA link, or through multiple modems connected to an *ARA server* — such as a Cayman GatorLink or

PM14400FXSA through the simulator, thought it was struggling to push data across a variety of impaired lines.

The telecommunications industry establishes impairment standards to describe a variety of phone-line situations. For our testing, we chose four common simulations: Best (a clean line), Earth (a rural line), Long Local Loop (a cross-country line), and Satellite (a satellite connection). We attached the PM14400FXSA to a Mac IIci via the *hardware-handshaking cable* required for top-speed performance, connected it over standard phone cable to the network simulator, and attached the simulator to a PowerBook 160 in which we'd installed the V.32bis internal modem to be tested.

We divided our tests into four groups. First — and most important for PowerBook users who want to take their office on the road — we tested with ARA (AppleTalk Remote Access). Under Best line conditions, we sent seven files — four of them compressible, one of them completely incompressible, one a Microsoft Word text file, and one a Microsoft Excel file. Because ARA handles its own compression, we turned off the PM14400FXSA's compression capabilities for this test.

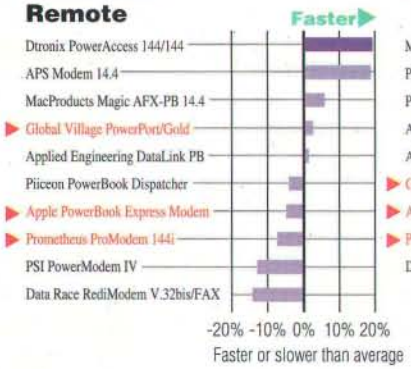
Second, to test how well each modem's *data pump* — the heart of its data-transfer capability — could cut through more-challenging conditions, we transferred the incompressible file and the Word and Excel files, with the simulator set to mimic Earth, Long Local Loop, and Satellite impairments.

Third, we checked each modem's compatibility and performance with the E-mail package QuickMail Remote, common among Macintosh users, using the PM14400FXSA-equipped IIci as a QuickMail server. We asked each PowerBook modem to send and receive 14 files, 1 of which contained 16 enclosures (the maximum number that QuickMail allows). As in the previous tests, all transactions and timings were handled automatically, with a script created in UserLand Frontier. We performed all QuickMail testing both under Best and Long Local Loop conditions.

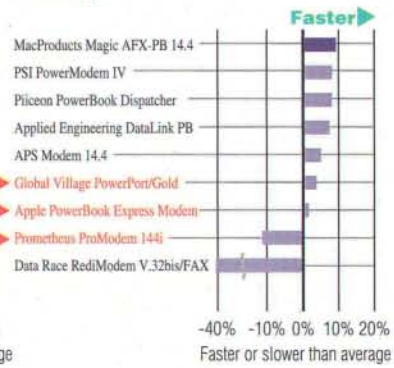
Our fourth and final test was of each modem's faxing capabilities. Using whatever software had shipped with the product, we tested how long it took to fax a five-page Word file at high resolution under Long Local Loop conditions from the PowerBook to the PM14400FXSA and then how long it took to receive the same file from the PM14400FXSA, which was running FAXsft. We noted off-hook and on-hook times to see how efficient each package was at converting the file to fax format and how long the phone line was in use.

— *Michael Mathog*

QuickMail Remote



Faxing



one of the Shiva LanRovers — you can access files, get E-mail, print documents . . . whatever. Just remember that if you want to communicate with your office at the highest possible speed, the modems at both ends of the connection must support the same high-speed telecommunication standard — and today's top performer is V.32bis.

When we tested each modem's ability to work with ARA, only two — the Apple PowerBook Express Modem and the Data Race RediModem V.32bis/FAX — were slow enough to be cause for concern. The Applied Engineering DataLink PB would have been one of the top performers, except that it was unable to connect at 14.4 kbps when it was receiving files, although it sent them just fine. The probable culprit is the Answer mode of Applied Engineering's CCL file — expect good performance as soon as Applied Engineering fixes it.

The two slowpokes — the PowerBook Express Modem and the RediModem V.32bis/FAX — each required significantly more time than the other modems did to exchange our suite of test files. Unlike all the others, the Data Race RediModem V.32bis/FAX couldn't connect at 14.4 kbps in either direction, even under perfect conditions — at only 9,600 bps, all file transfers took longer. A faulty CCL file is, again, the likely cause of the problem. The Apple PowerBook Express Modem, on the other hand, is slow because it performs data manipulation in software rather than in hardware.

We also tested the performance of each modem's *data pump,* the circuitry that translates the PowerBook's digital signals into analog audio tones to be transmitted over a phone line. We gave each a chance to prove itself on simulations of three common line types — a local call, a bounce off a satellite, and a cross-country terrestrial link. A local line is the cleanest, but even it picks up an occasional pop when rerouted by a switching device in a downtown phone office or a bit of hum when someone turns on a vacuum cleaner. The satellite connection suffers most from echo, caused by a bit of the transmitted signal bouncing back to the modem that sent it. A cross-country line is the toughest for most modems to negotiate, because it includes both the switching noise of a local call and the decrease in signal strength that's inevitable when long distances are involved.

These pesky phone-line gremlins are known as *line impairments,* and the more impairments disrupt a line, the more errors will occur. Phone phreaks aside, most users can't specify how their calls are routed, so we computed an overall score for each modem by weighting our individual test results based on the chances of encountering each type of impairment in the real world. The Prometheus ProModem 144i came out on top, handling all conditions very well. The worst performer was the Data Race RediModem V.32bis/FAX, which required 30 percent more time than the average.

If your office uses QuickMail, the popular E-mail package from CE Software, using QuickMail Remote can be the most efficient way to access your messages when you're on the road. When we tested each modem with QuickMail Remote, the APS Modem 14.4 and the Dtronix PowerAccess 144/144 essentially tied for first place — although setup was troublesome, because neither modem is specifically supported by QuickMail Remote. Most of the other modems performed reasonably well,

MacUser LABS Rating Tech Support

When you're miles from home and having problems with your PowerBook modem — your lifeline to your office network — you rely on fast, accurate, helpful technical support. Fortunately, we discovered that that's exactly what you get from most of the vendors whose modems we tested.

To discover the reliability of each vendor's tech support, we made anonymous calls, asking how to solve a typical problem. We noted how long it took us to reach the company's tech-support staff; whether (and for how long) we were put on hold once we got connected; and whether we had to leave a message and, if so, how long it took the company's representative to return our call.

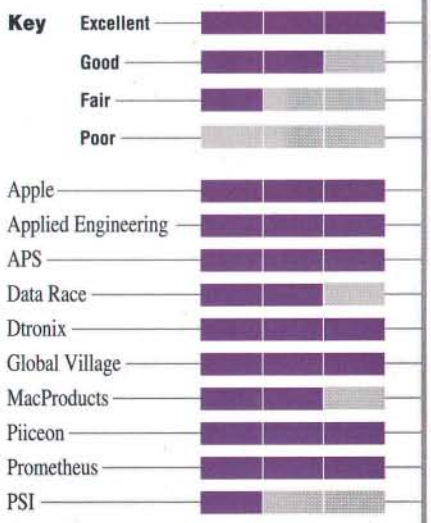
Once we'd connected with tech support, we evaluated each vendor's answers to these questions:

Q. I'm using AppleTalk Remote Access and can't seem to connect correctly. Sometimes I fail to connect at all. Why?

A. You're using the wrong CCL file.

Q. I'm calling CompuServe. I've set my telecommunications software to connect at 14 kbps, but when I link up, I get a message that says CONNECT 2400. What am I doing wrong?

A. You're calling the wrong phone number. CompuServe has different phone numbers for different modem speeds. (We awarded the vendor extra credit if we were offered a number for accessing the 9,600-bps service or if we were informed that CompuServe doesn't yet support 14.4-kbps modems.)



The PowerBook Express Modem had the shortest call duration for both sending and receiving.

with the worst less than 15 percent below average.

Finally, we tested each modem's built-in fax capability. Although it wasn't the fastest for converting or sending faxes, the MacProducts Magic AFX-PB 14.4 proved the fastest overall — converting the test files, sending them, and receiving an answer — by a small margin. The others all performed about the same, except for the Prometheus ProModem 144i and the Data Race RediModem V.32bis/FAX. These two were noticeably slower overall, primarily because they *sent* faxes slowly. The Global Village PowerPort/Gold returned control of the PowerBook faster than any other modem did — it was quickest at converting our test file to fax format. The next best, the Applied Engineering DataLink PB, required 35 percent more time to prepare the fax. The Data Race RediModem V.32bis/FAX and the Apple PowerBook Express Modem each took more than twice as much time as the PowerPort/Gold before they were able to start sending the fax.

In a surprising turn of events, the Apple PowerBook Express Modem had the shortest call duration for both sending and receiving. Most of the other modems were just seconds slower, so the toll savings don't amount to much. Although the Piiceon PowerBook Dispatcher

On Their Own

A high-speed internal PowerBook modem is inexpensive and convenient, but what if you need to use the same modem with your desktop Mac and your PowerBook? Or what if you're buying modems for an office full of PowerBook users but only a third of them need a modem at any one time? And what if you simply miss all those nifty blinking lights? The answer: You can get a portable, battery-operated, high-speed, fax-capable, V.32bis pocket modem.

The US Robotics WorldPort 14,400 for the PowerBook includes FAXstf, intelligent power management, an AC adapter, all necessary cables, and a 9-volt battery. Its list price of $699 is a bit steep, but you should be able to find one at a dealer for less. US Robotics, 8100 N. McCormick Blvd., Skokie, IL 60076; 708-982-5010.

For $599 list, the uncommonly cute Telebit QBlazer Plus includes a handy zippered carrying case along with cables and an AC adapter. Unfortunately, it also includes Quick Link II fax software — a hands-down loser in our fax-software evaluation. Telebit Corp., 1315 Chesapeake Terrace, Sunnyvale, CA 94089; 800-835-3248 or 408-734-4333.

Practical Peripherals' $499 contribution to the pocket-modem market is the PM14400FX PKT, a sleek unit that's marred by an external battery pack (with four AA batteries included). However, as with the QBlazer Plus, you get a full complement of indicator lights and a sturdy carrying case, and as with the other three pocket modems, all cables are included, along with an AC adapter. The bad news is that Practical Peripherals has also chosen Quick Link II as its modem's fax software. Practical Peripherals, 375 Conejo Ridge Avenue, Thousand Oaks, CA 91361; 805-497-4774.

The biggest bargain in pocket modems is the Bay Connection SpectraCom P1414. For the low list price of $349, you get all cables, a somewhat cheesy plastic carrying case, an AC adapter, and a 9-volt battery — but the best news is that Bay Connection, like US Robotics, bundles FAXstf. Bay Connection, 2717 Buena View Court, San Jose, CA 95121; 408-270-8070.

— Rik Myslewski

Swap a battery-powered portable modem between your PowerBook and your desktop Mac, or share it among your office's infrequent fliers (clockwise from top): the US Robotics WorldPort 14,400, Telebit QBlazer Plus, SpectraCom P1414, and Practical Peripherals PM14400FX PKT.

Even though reviewers rave about our fax/modems, there's always somebody who buys another brand.

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Go with the communications solution that has swept every top Macintosh award. Global Village.

When it comes to communicating from your Macintosh, you can't beat Global Village Communication. Which is why the industry experts at *MacUser*, *MacWorld*, and *MacWEEK* have all awarded Global Village their top awards.

MacUser, MacWorld and MacWEEK all come to the same conclusion: we make the best communications products for the Mac.

Whether you choose TelePort for desktop Macs or PowerPort for PowerBooks, all of our fax/modems feature the world's easiest and most integrated software interface, GlobalFax™. *MacWeek* called it, "a marvel– flexible for the novice, yet powerful enough for the experienced user." *MacComputing* said, "GlobalFax is the epitome of Macintosh desktop applications." And according to *MicroTimes*, GlobalFax is "a delight. Pressing the Option key converts from print to fax output. The fax directory, transmission and printing tools are comprehensive and easy to use."

TelePort for desktop Macs, PowerPort for PowerBooks: same intuitive GlobalFax interface.

Perfect for desktop Macs and PowerBooks

Both TelePort and PowerPort are available in Gold, Silver and Bronze price/performance options. From state of the art 14,400 bps to super affordable 2400 bps, there's a perfect Global Village fax/modem for you. So why stick your neck out with an inferior brand? For the Global Village dealer nearest you call

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The GlobalFax™ interface really is simple—if you know how to print, you know how to fax.

GLOBAL VILLAGE COMMUNICATION

CIRCLE 161 ON READER SERVICE CARD.

yielded respectable speed results, it had considerable difficulty handling the impaired lines.

The Dtronix Power Access 144/144 failed to connect to our test unit — a Practical Peripherals PM14400-FXSA V.32bis data/fax modem — even under the best line conditions. We were, however, able to get it to work with a stand-alone fax machine.

Fax Factors

In light of the modems' similar performances, unless you send dozens of pages a day, speed should not be your primary concern when shopping for a fax modem. Instead, focus on ease of use. Stf Technologies dominates the fax-software market. Its solid package, FAXstf, is included in some form or another with half of the modems we reviewed. Both MacProducts and Piiceon kept their modem prices low by including a $39 "lite" version called FAXstf LC. All but the most casual faxers will want to cough up the extra $50, plus shipping, to upgrade to the full-blown version, which is bundled with the Applied Engineering DataLink PB and the APS Modem 14.4.

PSI's FAXcilitate software is based on the complete FAXstf package, but all the features are grouped on a single Fax menu, at the right of the menu bar. Furthermore, PSI and Global Village include an OCR (optical character recognition) feature that extracts text from a standard bit-mapped-graphics fax so that you can edit the text with a word processor. The Global Village OCR feature is representative of the company's entire GlobalFax OCR software package: full-featured yet with the cleanest, most professional user interface of all (see Figure 2).

Apple Computer's Express Fax

In the Hotel

You're on a business trip, and your PowerBook is loaded with the best high-speed internal modem money can buy; your office network is equipped with the fastest, most reliable modems your network administrator can install. Why can't you connect? It may not be your fault or the fault of anyone back at the office. Your hotel may be to blame. Before your next trip, remember these tips:

Get the right room:

Some hotels have become modem-aware and have equipped rooms with jacks specifically for high-speed-modem use. When you call for reservations, ask about such rooms. (Hotels may charge $5 to $20 per night for the special jack.) If you use a travel agent or corporate travel service, consider adding this little requirement to your travel profile.

Avoid digital phone systems:

If your phone contains controls for your room's air conditioning or if it supports two separate lines, you may be a victim of the dreaded digital phone system — an impervious barrier for an analog modem. Take a look, though, and see if there is an RJ-11 jack on the side or the back of the phone. More and more digital hotel phones contain these jacks, which enable in-room modem use on digital systems.

If you want to be prepared for all eventualities, consider purchasing an adapter from Unlimited Systems (619-622-1400) that converts digital phone-speak into analog information your modem can understand.

Ask for help:

In some hotels, meeting your request for an in-room jack requires nothing more than installing a phone that has the correct adapter in your room. The charge for this change ranges from gratis to $15 — ask, though, to avoid a nasty three-digit surprise.

Order in your own phone lines:

If you'll be staying at a hotel for an extended time and you know far enough in advance that this will be the case, you can ask the hotel if you can get the local phone company to install a standard phone line just for you. Not only does this save you the 50-cent local per-call charge but it also frees up your room phone for incoming voice calls while you are linked to the office.

Build your own phone jack:

Older hotels that haven't been remodeled since the invention of the RJ-11 jack still use screw terminals for their phones. But if you have the right tools — and if you have the foresight to carry them and bring along an extra wall connector — it's surprisingly easy to install your own jack.

Use the business center instead:

If your modem needs are limited to once-a-day E-mail access, you should consider using the business center that many hotels provide. Many of these centers have credit-card phones with data jacks that allow you to connect your modem. But ARA users beware: You may need a CCL (connection control language) script that allows keypad dialing.

Use the airport lounge:

Hotels are not the only places where you will find data-ready credit-card phones. Airline luxury lounges (American's Admiral Clubs, United's Red Carpet Rooms, Delta's Crown Rooms, and

Unless you send dozens of pages a day, don't worry about speed when shopping for a fax modem.

Figure 2: Fax software doesn't get any better than Global Village's GlobalFax OCR. Easy-to-manage groups, powerful options, and handy cover-page memos are all accessible from the same convenient dialog box.

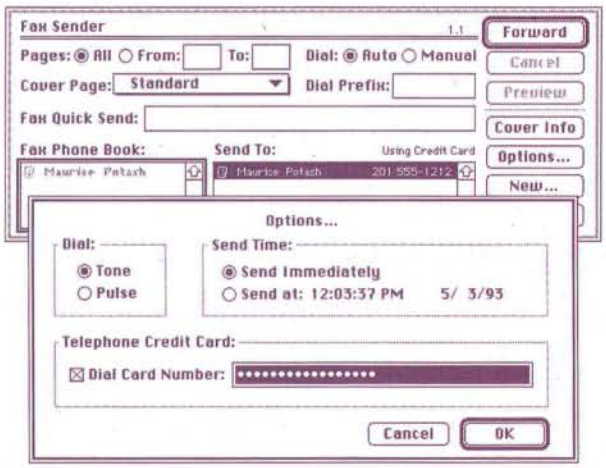

Figure 3: Apple's Express Fax software has a unique feature: It encodes your telephone-credit-card number, thus protecting it — and your account — from prying eyes.

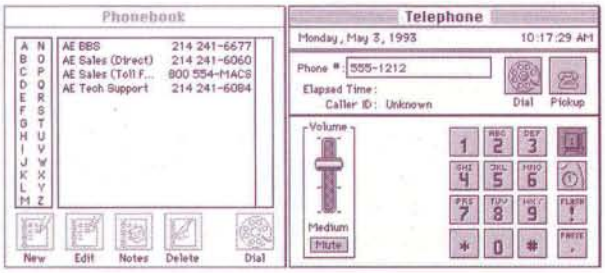

Figure 4: Unique among PowerBook modems, the Applied Engineering DataLink PB turns your PowerBook into a speakerphone. The company's CommPhone software includes a phone book and a call-duration indicator.

others) have such phones on desks. Some rooms even have computers and modems too — although Macs are in short supply. In most lounges, local calls are free, so you can use CompuServe or other on-line services by calling a local access number.

Make friends with the concierge:

If all else fails, ask the concierge if you can use the hotel's fax line — preferably at some wee hour. Many hotels have multiple fax machines and don't mind if you briefly disconnect one from the outside world. Don't forget to cover any toll charges you may incur — if asked.

Don't forget floppies:

Remember this rule of thumb: Daytime toll charges average $14 an hour, and in that hour, you can transfer roughly 5 megabytes of data via ARA, using a high-speed modem. A Federal Express overnight envelope is $15.50 for as many as 6 floppy disks (9 megabytes' worth) — less if your company is entitled to a discount; 12 disks run $22. Figure it out.

— Stephen Satchell

ILLUSTRATION: JACK MORTENSBAK

Off the Hook

A PowerBook and a cellular phone seem like a natural pair: mobile, convenient necessities for business travelers. At press time, Applied Engineering was the most active matchmaker of PowerBooks and cellular phones, with a family of related products. The Axcell cellular interface ($299) is a small box with one cable that you plug in to your PowerBook modem's RJ-11 jack and another that you plug in to the jack on your compatible cellular phone. The Axcell converts the signals and tones from your modem into signals that can control your cellular phone, enabling you to make data and fax connections anywhere you can access a cellular network. It works with any PowerBook and modem but is limited to use with AT&T, NEC, and OKI cellular phones.

Not yet shipping at press time but in the works from Applied Engineering are two other cellular products. The first, called the AErport, is an internal cellular telephone that works in conjunction with Applied Engineering's DataLink PB modem. With this arrangement, you have a complete land-line and cellular voice/data/fax setup, all within the cozy confines of your little ol' PowerBook — as long as it's not a Duo or a PowerBook 100.

Now, you may wonder just where a cellular phone can fit inside a PowerBook. Ah, there's the rub: It replaces your internal floppy drive, which Applied Engineering puts in an external floppy-drive case when it installs the AErport modem/phone. Your floppy drive then connects to your PowerBook via a PCMCIA interface, which is integrated into the AErport. The cost is around $2,000 and includes a DataLink PB modem and complete installation.

Applied Engineering's third new product is a version of the DataLink PB with cellular-interface functionality, similar to that of the Axcell interface, built in. This product's name, the price, and exactly how the cabling will work were still shrouded in mystery at press time.

Also barely visible through the mist is a dock for PowerBook Duos that has a built-in cellular telephone. No details of this upcoming product were available at press time. Even the company that will make it was secret.

It's far from clear how quickly cellular PowerBooking will take off. Several problems still plague this combination of technologies. For one, data rates are limited. You're lucky if you can make a connection at 4,800 bps; 14.4 kbps is out of the question. Another is that some cellular-phone services don't let you make direct-dial calls when you're roaming outside your home-cell area, which makes it a tad difficult to place data and fax calls. And finally, receiving calls is a bit difficult too — you have to leave your cellular phone on all the time, which drains the battery.

— *Henry Bortman*

Add an Applied Engineering Axcell interface to your compatible cellular phone, and you're no longer tied down by phone lines.

Data Race's technical-support rep didn't even have a Mac on which to test the firm's own modem.

software (see Figure 3) is another one of the better fax packages. Not only does it come with the most powerful cover-page editor but also the fax-preview feature can show you what the cover page will look like, unlike with most other packages, which refuse to generate a cover page until just before you send a fax. Another great feature is *smart resend.* Most modems automatically resend an entire fax if it doesn't go through on the first attempt; with smart resend, only those pages that didn't make it through are retransmitted.

Overall, Prometheus' MaxFax is one of the stronger packages: It supports smart resend as well as the ability to send faxes with as many as 16 levels of beautifully dithered gray. With all the other fax modems, attempting to send a color or gray-scale image results in a high-contrast mess unless the application from which you fax automatically predithers a gray-scale image.

Only Global Village's GlobalFax OCR and BIT Software's BitFax, which comes with the Data Race RediModem V.32bis/FAX, feature *smart dialing,* which compares the local area code — entered by the user — with that of the fax recipient and dials accordingly. The smart-dialing feature, however, is about the only good thing about BitFax, which — along with Smith Micro's Quick Link II, bundled with the Dtronix

▶ The Bottom Line

Install a high-speed PowerBook modem, and you can take your office on the road. You can exchange files with anyone on your office network, trade messages, send faxes — and in some cases, even convert faxes into editable documents or turn your PowerBook into a full-featured phone. With rare exceptions, the performance of the modems we tested was uniformly good, so choose your modem based on price, warranty, and software.

If you're looking for a good modem at a great price, check out the **Prometheus ProModem 144i** ($349 list, $275 street), one of the best deals of all the modems we examined. Because the price is this low, we're willing to overlook a few minor shortcomings, especially in light of Prometheus' knowledgeable technical support and the product's five-year warranty. Although it was a little slower than most when sending faxes and exchanging QuickMail messages, the ProModem 144i had the fastest data pump by a comfortable margin and was among the best performers in our ARA (AppleTalk Remote Access) tests. And although not the best of the software packages bundled with the modems, Prometheus' proprietary MaxFax software was a solid contender, with exceptional gray-scale capability and flexible import/export features. Furthermore, Prometheus promises a major update soon that will include smart dialing, among other features.

If money is no object, go for a **Global Village PowerPort/Gold** ($499 list, $450 street). From the moment you open the ecologically sound box to the time you effortlessly send your first fax, you know you're in the hands of a company that cares about your total experience with its product. The PowerPort/Gold didn't excel in any one test, but it was consistently better than average in all of them. And when it comes to fax software, nothing comes close to GlobalFax OCR. Its intuitive design belies a powerful feature set that includes smart dialing, editable cover pages, and built-in OCR capabilities.

Your PowerBook isn't complete without an affordable Prometheus ProModem 144i (top) or a top-of-the-line Global Village PowerPort/Gold (left). Today, your PowerBook Duo has to settle for an Apple PowerBook Express Modem (right), but competition is coming soon.

Finally, if you own a PowerBook Duo, your only current choice for an internal modem is the **Apple PowerBook Express Modem** ($319 list, $275 street). By reducing hardware costs and relying on software to perform many standard modem tasks, Apple is able to set an attractive price. With the exception of getting slower than average results in our ARA tests, the Express Modem performed acceptably in all of our other tests. Apple's Express Fax software is serviceable, even though it lacks a handy smart-dial feature like GlobalFax OCR's. Be sure to check out the Express Modem's compatibility with your favorite telecommunications application, though — the modem's unique architecture can lead to problems with some software.

By the time you read this, Global Village should have released its outstanding software in a stand-alone version written for the Duo Express Modem. Even more intriguing is the company's promise to market a PowerPort modem designed specifically for the Duo. Given Global Village's track record of fine products, this is one development that Duo owners should watch with great interest.

PowerAccess 144/144 — is to be avoided.

With BitFax, you must go to the Chooser to place the modem in either fax or data mode. Furthermore, there's no way to bypass the Chooser when you want to fax a single document: With all the other modems' fax software, the Print command is simply replaced by Fax when you hold down a modifier key as you choose Print from the File menu. Finally, although a PowerBook can be set to wake up when it receives a phone call, BitFax refuses to answer, because the modem shuts itself off when the PowerBook goes to sleep. When we called Data Race to confirm this behavior, the technical-support representative didn't even have a Mac on which to test the company's own modem.

Table 1 Criteria

List price — The vendor's suggested retail price.

Street price — The average actual price charged by a sample of dealers around the U.S. in April 1993.

Data transmission — The communications standards the modem can use to communicate with other modems that use the same standards.

Fax transmission — The fax-transmission standards the modem can use to communicate with other modems and stand-alone fax machines that use the same standards.

Error control — The error-control standards the modem can use to ensure data integrity when communicating with other modems that use the same standards.

Data compression — The data-compression standards the modem can use to compress data before transmission if the receiving modem, which must use the same standards, can decompress it.

Telecom software — The telecommunications software included.

Fax software — The fax-management and -transmission software included.

Cover-page editor — Does the fax software include a facility for editing a fax cover page?

Smart dial — Can the fax software decide whether or not to use area codes in its fax-number database, depending on the area code entered by the user?

Smart resend — Can the fax software instruct the modem to resend only those pages of a fax message that have yet to be sent after a connection has been lost?

Chooser bypass — Is a hot key available that lets the user get around going to the Chooser to begin each fax session?

Gray scale — Can the fax software produce gray-scale images?

OCR — Does the software include OCR (optical character recognition) facility for converting a fax into editable text?

The Quick Link II fax software provided with the Dtronix Power Access 144/144 is awkward and confusing. Although the documentation specifically claims that the software is Mac-like, the program has many user-interface violations, including check boxes used incorrectly and windows lacking zoom boxes. Cover pages are supported, but you can't choose among them at fax time. When you're faxing, an alert box appears, but it doesn't give you information on what speed the connection is using nor does it indicate the percentage complete. Finally, the software tries to send a fax again if the modem detects a busy signal but not if it encounters an error during transmission.

The Next and Last Word

All of today's internal V.32bis PowerBook modems enable you to seamlessly link up with your office network, and all provide the convenience of high-speed fax software. Although several vendors have announced future plans, at press time, the Applied Engineering DataLink PB was the only PowerBook modem

Table 1: Features of V.32bis PowerBook Modems

● = yes ○ = no	▶ Apple PowerBook Express Modem ttt½	Applied Engineering DataLink PB ttt	APS Modem 14.4 ttt	Data Race RediModem V.32bis/FAX t½	Dtronix PowerAccess 144/144 tt½
List price	$319	$525	$299	$499	$319*
Street price	$275	$500	$299 (direct)	$450	$300*
Pros	Inexpensive. Good fax software. Good security features.	Good fax software. Unique two-way voice capability with innovative microphone.	Inexpensive. Good fax software. Fastest overall.	Long warranty.	Inexpensive. Fastest with QuickMail Remote. Long warranty.
Cons	Slow with ARA. Overall performance below average.	Expensive. Overall performance below average.	Short warranty.	Expensive. Poor fax software. Slowest overall.	Poor fax software.
Standards					
Data transmission	V.32bis, V.32, V.23, V.22bis, V.22, V.21, Bell 212A, Bell 103	V.32bis, V.32, V.23, V.22bis	V.32bis, V.32, V.23, V.22bis, V.22, V.21, Bell 212A, Bell 103	V.32bis, V.32, V.22bis, V.22, V.21, Bell 212A, Bell 103	V.32bis, V.32, V.23, V.22bis, V.22, V.21, Bell 212A, Bell 103
Fax transmission	V.29, V.27ter	V.29, V.27ter, V.21ch2, V.17	V.30, V.29, V.27ter, V.21ch2, V.17, T.4	V.29	V.29, V.27ter, V.21ch2, V.17
Error control	V.42, MNP 2 – 4	V.42, MNP 2 – 4, MNP 10	V.42, MNP 2 – 4, MNP 10	V.42, MNP 1 – 4	V.42, MNP 1 – 4
Data compression	V.42bis, MNP 5	V.42bis, MNP 5	V.42bis, MNP 5	V.42bis, MNP 5	V.42bis, MNP 5
Software					
Telecom software	none	Terminal 2.0, CommPhone	none	MicroPhone 1.7	Quick Link II
Fax software	Express Fax	FAXstf 2.2.3	FAXstf 2.2.3	BitFax 1.8.4	Quick Link II
Fax features					
Cover-page editor	●	●	●	●	●
Smart dial	○	○	○	●	○
Smart resend	●	○	○	○	○
Chooser bypass	●	●	●	○	●
Fax preview	●	●	●	○	●
Gray scale	○	○	○	○	○
OCR	○	$119 option	$119 option	○	○†
Warranty	1 year	3 years	1 year	5 years	5 years
Company	Apple Computer, Inc. 20525 Mariani Ave. Cupertino, CA 94086 800-776-2333 408-996-1010	Applied Engineering 3210 Beltline Rd. Dallas, TX 75234 800-554-6227 214-241-6060 214-484-1365 (fax)	APS Technologies 2900 S. 291 Hwy. Independence, MO 64057 800-235-2752 816-478-8300 816-478-4596 (fax)	Data Race 11550 IH 10 W., Ste. 395 San Antonio, TX 78230 800-749-7223 210-558-1900 210-558-1929 (fax)	Dtronix 3140 De La Cruz Blvd. Santa Clara, CA 95054 800-995-1711 408-982-9667 408-982-9640 (fax)

*Price includes rebate of as much as $30 for dealer installation.

†Should be available by the time this article is in print.

▶ *MacUser* Bottom Line pick

A tiny 105MB lightning fast removable drive for only $749 is no small feat.

The unlimited storage of a removable. A 3.5" high-performance 105MB cartridge hard disk small enough to fit in your shirt pocket. What more can you ask of a removable drive? How about being the fastest removable cartridge drive you can buy with a near zero access time of 14.5ms. One that uses the same dependable Syquest technology as Focus 44MB and 88MB drives. All packed into a drive with a footprint no bigger than, well, about half a foot.

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CIRCLE 126 ON READER SERVICE CARD.

shipping with voice support. When it's coupled with AE's CommPhone software, the DataLink PB lets you use your PowerBook as a telephone and answering machine (see Figure 4). Also included is the Jabra Ear Phone, which is an innovative earphone/microphone that fits inside your ear and picks up your voice through the vibrations in your skull — thus reducing any problems you might have with ambient noise.

Because PowerBook users are often on the go, it remains to be seen how practical voice capability will turn out to be. What is certain, however, is that high-speed internal PowerBook modems are inexpensive, powerful, full-featured, and — by and large — fast and efficient. If you want to be a well-connected business traveler, install one in your PowerBook and don't leave home — or your office — without it.

Owen W. Linzmayer relied on modems while researching his Sybex book, *Totally Rad Mac Programs,* and his forthcoming book, *Attack of the Killer Macs.* Michael Mathog, a project leader at ZD Labs, managed the testing for this report.

Table 1: Features of V.32bis PowerBook Modems, continued

● = yes ○ = no	▶ Global Village PowerPort/Gold ♦♦♦♦½	MacProducts Magic AFX-PB 14.4 ♦♦♦	Piiceon PowerBook Dispatcher ♦♦♦	▶ Prometheus ProModem 144i ♦♦♦♦	PSI PowerModem IV ♦♦♦½
List price	$499	$299	$329	$349	$495
Street price	$450	$299 (direct)	$300	$275	$400
Pros	Good fax software. OCR capability included. Long warranty.	Inexpensive. Good fax software. Fastest for faxing. Long warranty.	Inexpensive. Good fax software. Long warranty.	Inexpensive. Good fax software. Fastest data pump. Long warranty.	Good fax software. OCR capability included. Fastest with ARA. Long warranty.
Cons	Expensive.			Slow for faxing.	Expensive. Slow with QuickMail Remote.
Standards					
Data transmission	V.32bis, V.32, V.23, V.22bis, V.22, V.21	V.32bis, V.32, V.23, V.22bis, V.22, V.21, Bell 212A, Bell 103	V.32bis, V.32, V.23, V.22bis, V.22, V.21, Bell 212A, Bell 103	V.32bis, V.32, V.23, V.22bis, V.22, V.21, Bell 212A, Bell 103	V.32bis, V.32, V.23, V.22bis, V.22, V.21, Bell 212A, Bell 103
Fax transmission	V.29, V.27ter	V.29, V.27ter, V.21ch2, V.17	V.29, V.27ter, V.21ch2, V.17	V.29, V.17	V.29, V.17
Error control	V.42	V.42, MNP 2 – 4	V.42, MNP 1 – 4, MNP10	V.42, MNP 1 – 4	V.42, MNP 2 – 4
Data compression	V.42bis, MNP 5	V.42bis, MNP 5	V.42bis, MNP 5	V.42bis, MNP 5	V.42bis, MNP 5
Software					
Telecom software	none	MicroPhone 1.7	MicroPhone 1.7	MacKnowledge	FreeTerm, MacIntercom
Fax software	GlobalFax OCR	FAXstf LC 2.2.3	FAXstf LC 2.2.3	MaxFax	FAXcilitate 1.0
Fax features					
Cover-page editor	●	○	○	●	●
Smart dial	●	○	○	○	○
Smart resend	○	○	○	●	○
Chooser bypass	●	●	●	●	●
Fax preview	○	●	●	○	●
Gray scale	○	○	○	●	○
OCR	●	$119 option	$119 option	○	●
Warranty	5 years	lifetime	lifetime	5 years	5 years
Company	Global Village Communication 685-B E. Middlefield Rd. Mountain View, CA 94043 800-736-4821 415-390-8200 415-390-8282 (fax)	MacProducts USA 608 W. 22nd St. Austin, TX 78705 800-622-3475 512-472-8881 512-499-0888 (fax)	Piiceon, Inc. 1996 Lundy Ave. San Jose, CA 95131 800-366-2983 408-432-8030 408-943-1309 (fax)	Prometheus Products 9524 S.W. Tualatin-Sherwood Rd. Tualatin, OR 97062 800-477-3473 503-692-9600 503-692-1101 (fax)	PSI Integration, Inc. 851 E. Hamilton Ave. Campbell, CA 95008 800-622-1722 408-559-8544 408-559-8548 (fax)

▶ *MacUser* Bottom Line pick

Big news for small business! This easy new software keeps your books...

Finally! Small business bookkeeping that works exactly the way you do.

You've got to manage your money. But you have a small business to manage, too. That's why BESTBOOKS by Teleware goes far beyond a checkbook or personal finance program. It produces invoices, tracks sales and expenses, and much more. Then it *organizes* those records to fit the way you run your business.

Want to know what a customer owes you? A click of the mouse brings you their outstanding balance. *Click.* You see their billing and payment history. *Click.* Individual invoices. One final *click* and BESTBOOKS™ even dials their number.

Incredibly easy. MACWORLD gives it a ★★★★ rating!

When *MACWORLD* gave BESTBOOKS a ★★★★ rating, they called it "bookkeeping without the jargon, simple operation... an excellent value." You can be up and running, recording transactions in less than a minute. All checks and forms look like the real thing. Just fill them in. Even better, BESTBOOKS:

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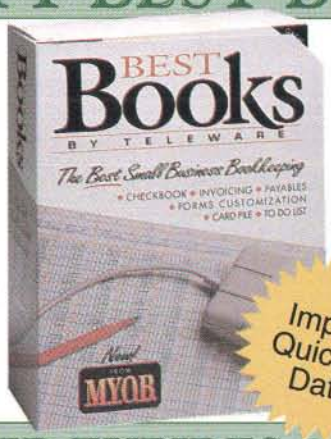

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COLOR *for*

Choosing the best color monitor used to be simple: You opened your wallet wide and got what you paid for. For years, people paid a premium for the venerable 13-inch AppleColor High-Resolution RGB Monitor, and they got superior sharpness and color quality for their hard-earned dollars. But the $999 price tag kept many prospective buyers at a distance — some settled for lower quality at a lower price.

Today, purchasing a color monitor can be more complicated. The overall quality of monitors continues to improve at the same time that prices, in many cases, are dropping. For example, the NEC MultiSync 4FG, a "Bottom

PHOTOGRAPHY: FRED STIMSON; SCREEN IMAGE: © 1993 RON KIMBALL STUDIO

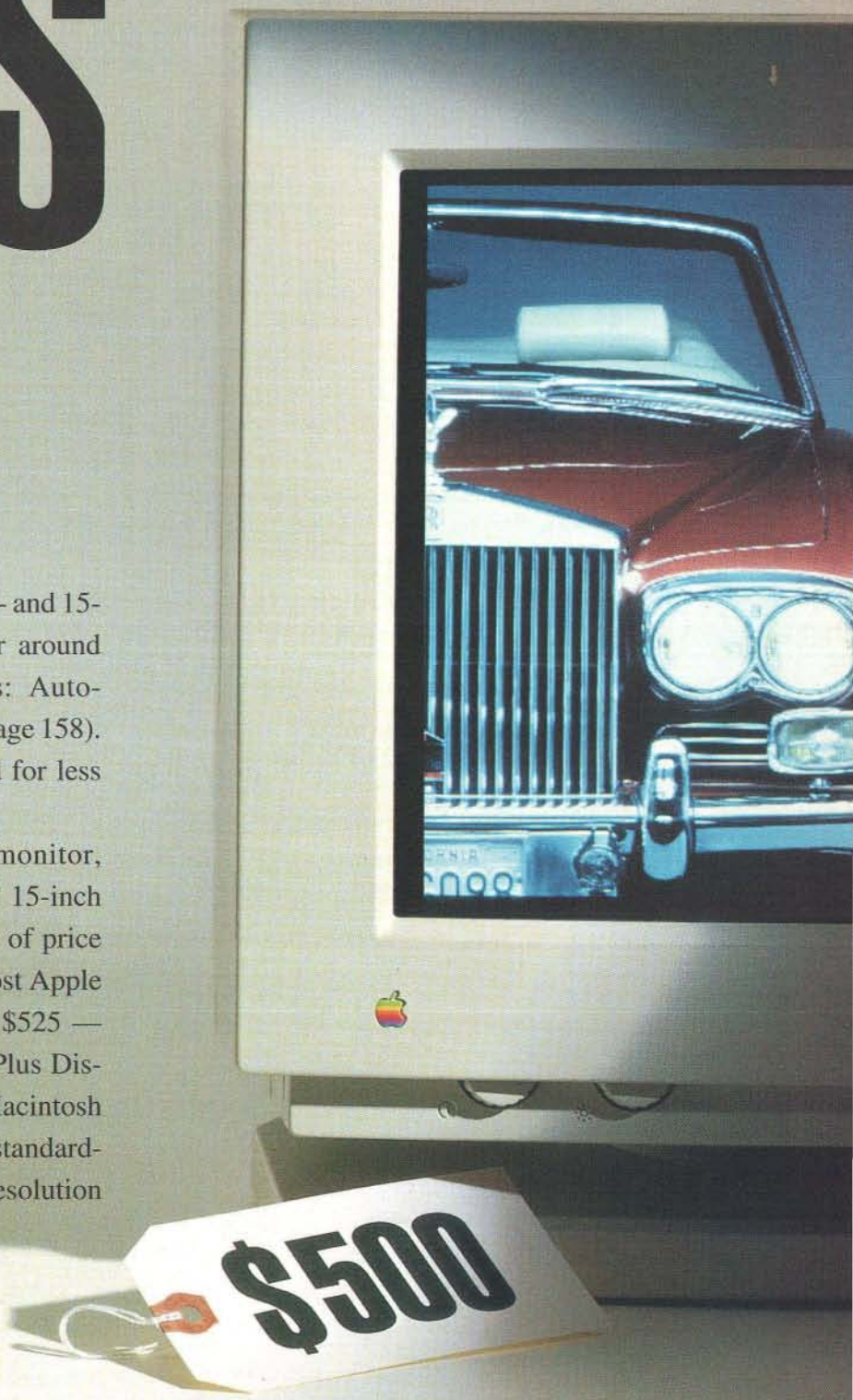
LESS

Just because one monitor costs twice as much as another, that doesn't mean it's twice as good.

BY JAMES HONG

Line" pick in last year's roundup of 14- and 15-inch color monitors, used to sell for around $800 (see "Perfection for Pennies: Auto-synchronous Monitors," August '92, page 158). The same monitor now can be found for less than $740.

To help you choose the right monitor, MacUser Labs selected six 14- and 15-inch color monitors representing a variety of price levels. We looked at three new low-cost Apple color monitors, priced from $305 to $525 — the Performa Display; the Performa Plus Display; and the new 14-inch Apple Macintosh Color Display, which replaces the standard-setting 13-inch AppleColor High-Resolution



RGB Monitor in Apple's monitor line. We also evaluated three higher-priced color monitors — the Nanao FlexScan F340iW, the Sigma Designs ColorMax 15, and the Sony CPD-1430 — that sell for $650 or more apiece. These higher-priced models are autosynchronous, which means they can work with either a Mac or a PC.

Simple as 1-2-3

You won't experience much trouble setting up any of these monitors. For the most part, the instructions that we received with our review units were simple and straightforward. All the monitors come with their video cables permanently attached (that's one less cable to misplace).

Our three plug-and-play Apple monitors were ready right out of the box; the three autosynchronous monitors required a video-cable adapter to work with the Mac. The Sony CPD-1430 included the proper adapter, although it was not mentioned in the documentation. The Sigma Designs ColorMax 15 came with an adapter for PowerBooks, Quadras, and Duos; an adapter for the Mac II family is available on request. (Of the autosynchronous monitors, only the ColorMax 15 came with a manual written specifically for the Macintosh; oddly enough, that documentation failed to mention that the ColorMax 15 is also PC-compatible.) Nanao not only failed to include an adapter for the Mac but also neglected to mention that you need one.

At a Glance

▶ Apple Macintosh Color Display	‡‡‡‡
Apple Performa Display	‡‡
Apple Performa Plus Display	‡‡‡½
Nanao FlexScan F340iW	‡‡‡½
Sigma Designs ColorMax 15	‡‡‡
▶ Sony CPD-1430	‡‡‡‡½
▶ *MacUser* Bottom Line pick	

Out of Control

After we set up the monitors, we turned our attention to the knobs and dials. The best controls are easy to locate and easy to use. All six monitors include controls for adjusting brightness, contrast, and the horizontal and vertical position of the image. Except for the horizontal- and vertical-position control on the Apple Macintosh Color Display, all these controls are easily accessible on the fronts of the monitors. (The Apple Macintosh Color Display control is recessed in the back, and you need a special tool — which is not included with the system — to operate the control.) The Nanao, Sigma, and Sony monitors include a control that enables you to adjust for pincushioning — a form of image distortion in which straight lines bow inward or outward.

All but the Apple Macintosh Color Display feature controls for horizontal and vertical size. Except for those on the Nanao FlexScan F340iW and the Sony CPD-1430, these are

MacUSER LABS Figure 1: Good and Fuzzy

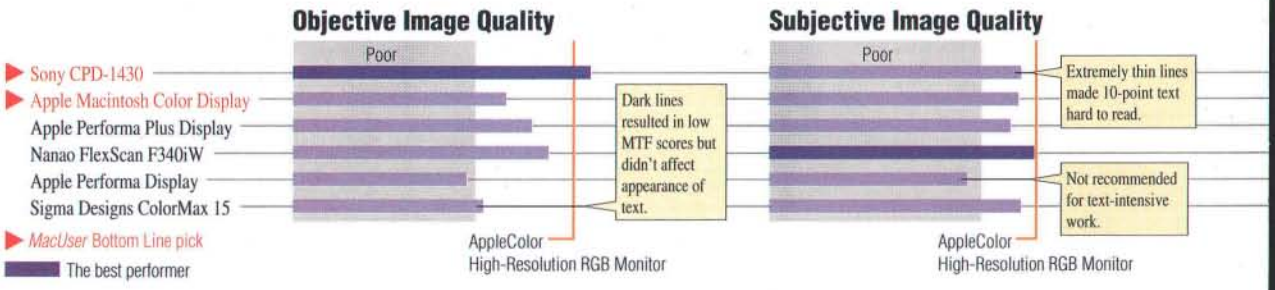


Figure 1: First, our technicians tested these six color monitors for focus, color quality, and brightness. Then our jury of monitor experts scrutinized the displays for image and color quality. We compared the results for each monitor with the performance of a 13-inch AppleColor High-Resolution RGB Monitor.

Objective Image Quality:

To see how sharp the displays were, we used a Microvision Superspot 100 System to measure convergence and MTF (modulation transfer function). Of all the monitors, only the Apple Performa Display recorded unacceptable sharpness scores.

Subjective Image Quality:

Our jury analyzed each monitor for focus, geometry, nuisance factors (such as jitter, swim, and drift), and text quality. The Apple Performa Display's poor showing in our objective image-quality tests was confirmed by our jurors — text was difficult to read, and our pattern of fine lines turned into a mass of gray squares.

MacUser LABS Figure 2: Clear as Mud

The Apple Performa Display's text quality is too fuzzy.

The Nanao FlexScan F340iW's text quality is just right.

The Sony CPD-1430's text quality is too crisp.

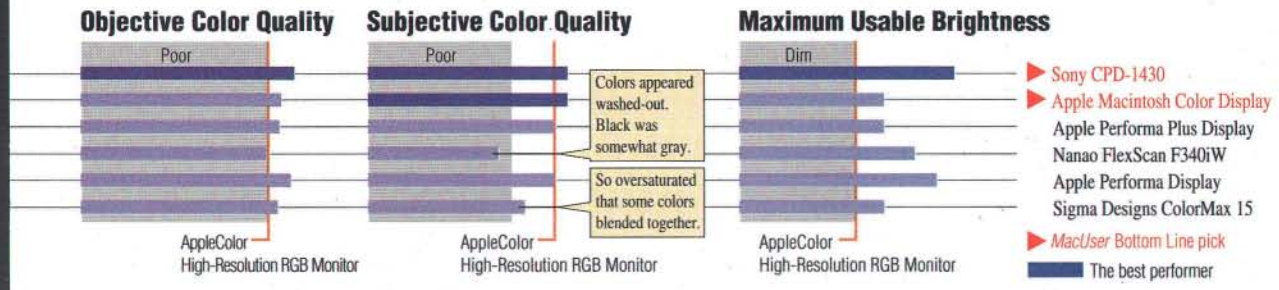
Figure 2: These diagrams illustrate text quality as seen on these displays. The inexpensive Apple Performa Display produced fuzzy text that could give you a headache after only a few minutes. The Nanao FlexScan F340iW displayed the best text quality of the displays we tested. Text was so crisp and sharp on the Sony CPD-1430 that text quality actually suffered.

You won't experience much trouble setting up any of these monitors. For the most part, the instructions we received with our review units were simple.

standard analog controls. The Nanao and Sony monitors have digital controls with preset memory, a necessity for switching between PCs and Macs.

Supporting Cast

Although it doesn't take a degree in engineering to operate a color monitor, you may need to call for assistance from time to time. To evaluate the technical support provided for these monitors, we called each company twice, anonymously,



Objective Color Quality:

We used a Minolta Color Analyzer CA-100 to measure three aspects of each monitor's color quality: color range, color tracking (how consistently the red, green, and blue phosphors were illuminated at incremental levels), and spatial uniformity (how consistent the display's brightness remained over the entire screen). All the monitors fared well in our objective color tests.

Subjective Color Quality:

Our jury examined each monitor's representation of a color palette for accurate pastels and good saturation of primary colors. Four of the displays looked as good as, if not better than, that of the 13-inch AppleColor High-Resolution RGB Monitor. The Nanao FlexScan F340iW and the Sigma Designs ColorMax 15 didn't quite measure up.

Maximum Usable Brightness:

Finally, we measured how high each display's brightness could be turned up without sacrificing sharpness. A display that can be turned up until it's very bright, such as the Sony CPD-1430's, combats glare, is easy to read for long periods, and allows for high contrast.

The most important attribute of any display is sharpness. After all, if you stare at a blurry screen all day, you're bound to go home with a headache.

and asked for help with two problems. We noted whether the tech-support staff treated us with courtesy and, most important, whether they could identify the cause of and solve our problems (see the "Rating Tech Support" sidebar).

We evaluate issues such as tech support, ease of installation, and documentation to give you a complete picture of the products and the companies behind them. But of course, your main concern in buying a monitor is how good its display looks.

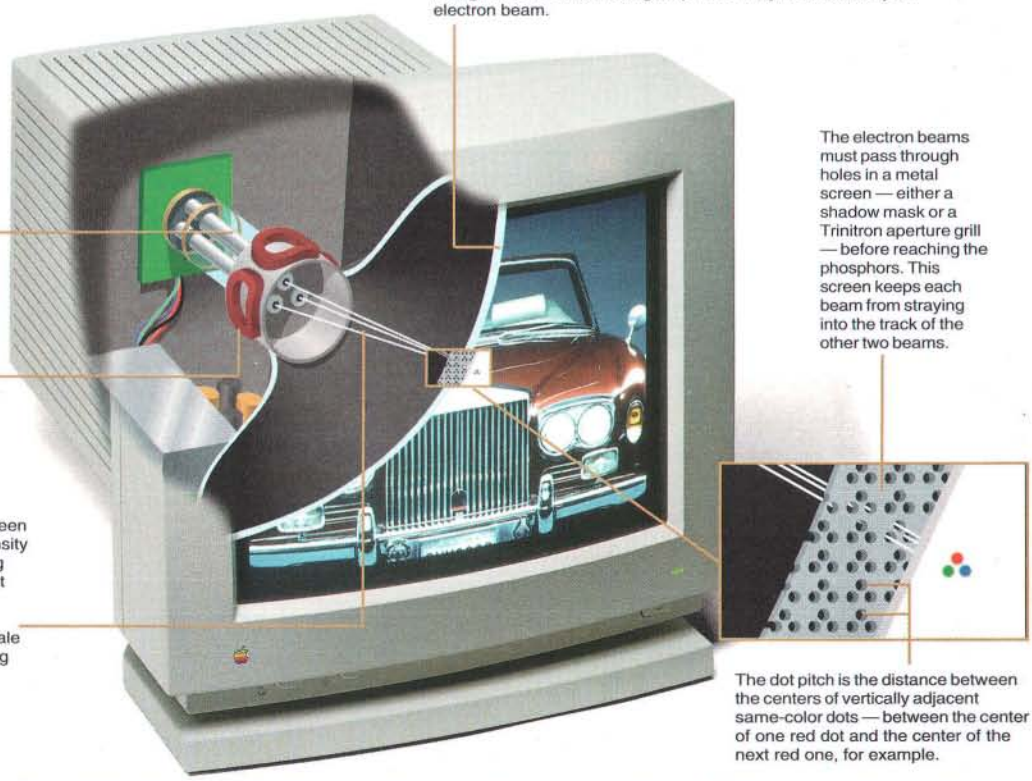
Sharper Image

The most important attribute of any display is sharpness. After all, if you stare at a blurry screen all day, you're bound to go home with a headache. We measured the sharpness of each display both objectively and subjectively. To get the objective picture, we used a Microvision Superspot 100 System to perform MTF (modulation transfer function) and convergence tests. MTF is a measurement of the contrast between fine, 1-pixel-wide alternating black and white lines: A monitor with a high MTF score displays text that is easily readable at small sizes. We performed MTF tests with horizontal as well as vertical parallel lines.

Misconvergence, or the misalignment of a monitor's electron guns, also reduces a display's focus and clarity. Instead of illuminating only the correct phosphor, the misconverged beam hits all or part of another phosphor as well, creating a slight shadow of red, green, or blue around your screen image (see the "Behind the Screens" sidebar).

The Sony CPD-1430 and the

MacUSER LABS Behind the Screens



Nanao FlexScan F340iW came in first and second, respectively, in our objective sharpness tests. All the other monitors performed adequately, except the Apple Performa Display, which recorded poor MTF scores (see Figure 1).

When we set up these monitors in front of a panel of experts for a subjective evaluation, the Performa Display's poor sharpness scores were confirmed. Fine lines were blurred and 10-point type was illegible. Extended use of this monitor could lead to eyestrain and headaches.

A Colorful Bunch

An issue secondary to sharpness is color quality — we looked at each display's range of color and brightness and at the uniformity of screen illumination. We examined color tracking and chromaticity with a Minolta Color Analyzer CA-100. The color-tracking test measured the intensity of each of the monitors' three primary colors (red, green, and blue) at different brightness levels. If one of the electron guns is more powerful than the others, the monitor's ability to represent accurate colors will be impaired. For instance, your screen will suffer from a greenish tint if the electron gun aimed at the green phosphor dots is stronger than the other two guns.

Chromaticity is simply the maximum range of colors the monitor can produce. The Sony CPD-1430 displayed the widest range of colors of the monitors we tested. The Nanao FlexScan F340iW had the smallest color range, and its colors appeared washed out. However, with a system gamma of .99 out of a possible score

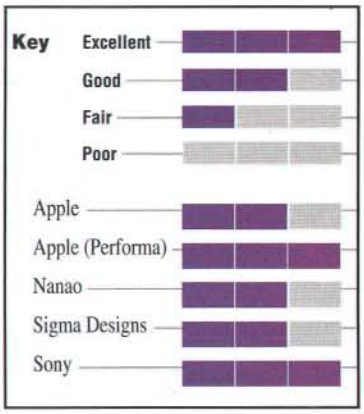
MacUser LABS Rating Tech Support

Although monitors are not really difficult to set up, it's nice to know that a company is willing to offer a helping hand if you have a problem. To see what sort of support you can expect after you purchase one of these monitors, our technicians placed two anonymous calls to each of the companies that had a product in this report. All of the tech-support departments provided competent and accurate support, but two stood out from the crowd: Apple's Performa-line tech support and Sony's.

Tech support is something new for Apple, which used to direct customers to its dealers for assistance. Not only does Apple now have its own customer-service line but the company has also designated a separate tech-support line exclusively for its Performa products. The Performa support people were extremely enthusiastic and helpful.

Sony, which used to have just one overworked tech-support person, now has three. The representative we reached not only answered all of our questions but also made sure that we understood everything before the call was over.

Here are the questions we asked and the answers we expected:



Q. I just moved my computer system yesterday, and now the display appears wavy and discolored. What happened? It was working fine yesterday.

A. The monitor is located too close to a power source. (In our case, it was simply a matter of moving a fluorescent lamp away from our monitor.)

Q. I just upgraded from a Macintosh 12-inch RGB monitor to your monitor for use with my LC. Now instead of 256 colors, the most I can get is 16. What did I do wrong?

A. The technician should ask how much VRAM is installed in your computer. In order to get 256 colors from built-in video on the LC, you need to have at least 512K of VRAM.

Color monitors are sensitive to interference, which can cause poor color convergence. For example, an electron beam that's intended to illuminate a red phosphor dot might hit part of a blue phosphor dot as well as hitting the red one. Misconvergence appears most often in the corners of the screen: You might notice that the outline of a white or black text character or line has either red, green, or blue shadows, depending on which electron gun is not properly adjusted. The Apple Performa Display suffered from the worst focus and exhibited the most misconvergence. Although all the other monitors we tested had a dot pitch between .25 and .29 millimeters, the Performa Display had a monstrous dot pitch of .39 millimeters. Because the dots were so far apart, red, green, and blue couldn't all fit into one pixel, so text looked fuzzy. The Performa Display had such terrible convergence that 10-point type was fuzzy and illegible — a serious drawback for desktop publishing and other text-intensive work.

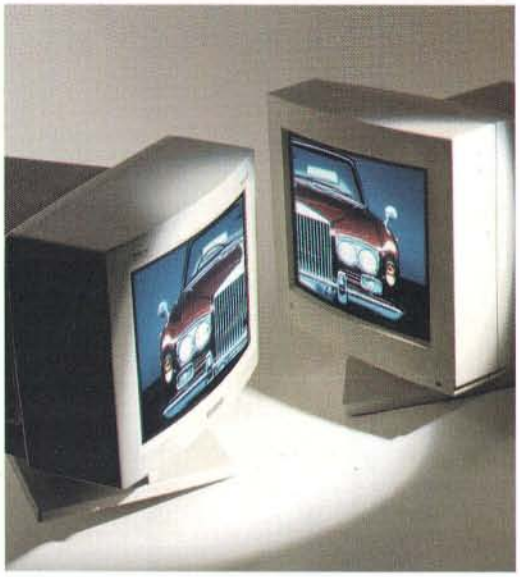
— Katie Barnes

When we set up these monitors in front of a panel of experts, the Performa Display's poor sharpness scores were confirmed.

▶ The Bottom Line

If you're looking for a small color monitor, you'll find some great deals out there. For those who are concerned with color quality and sharpness, the **Sony CPD-1430** ($1,030 list, $650 street) was our clear winner: It placed first or second in all of our tests. Because it's autosynchronous, the CPD-1430 works with PCs as well as with Macs, making it a good choice for cross-platform environments.

The **Apple Macintosh Color Display** ($589 list, $525 street) is a good bet for those who are on a tighter budget. It replaces the old favorite, the 13-inch AppleColor High-Resolution RGB Monitor. Although the new Macintosh Color Display isn't quite as sharp as its older sibling, it boasts superior color quality and brightness while costing hundreds less — and it has a tilt/swivel stand. At press time, Apple had lowered the list price to $539, so look for the street price to be even lower.



Rising stars: The Sony CPD-1430 (left) and the Apple Macintosh Color Display (right) will be sure to turn more than just a few heads.

of 1.0, the FlexScan F340iW came closest to achieving perfect gray linearity — ideal for desktop publishers. (Gamma is a measurement of contrast and of how accurately a monitor displays brightness: The monitor with the highest system-gamma score produces the truest color and gray scale for scanned images.)

Pay More or Pay Less?

When we began this evaluation, the least expensive of the six monitors was the Apple Performa Display. As we learned from its dismal performance, sometimes you get exactly what you pay for in a monitor. At press time, Apple had decided to stop selling the Performa Display as a stand-alone product. Instead, the monitor will be bundled with the Performa computer.

In weighing the quality of the other monitors against their prices, we found that high price does not guarantee high quality. For example, the monitor with the highest street price was the undistinguished Sigma Designs ColorMax 15. For desktop publishers who require a sharp display that allows them to see fine shadow detail in their scanned images, the Nanao FlexScan F340iW fills the bill — but that's only if you can afford to spend $750 and you don't mind a limited color range. For the best buys of the bunch, see the "Bottom Line" sidebar.

James Hong has been working with Macs since 1985. Brian Fykes and Katie Barnes, ZD Labs project leaders, managed the testing for this report.

Table 1 Criteria

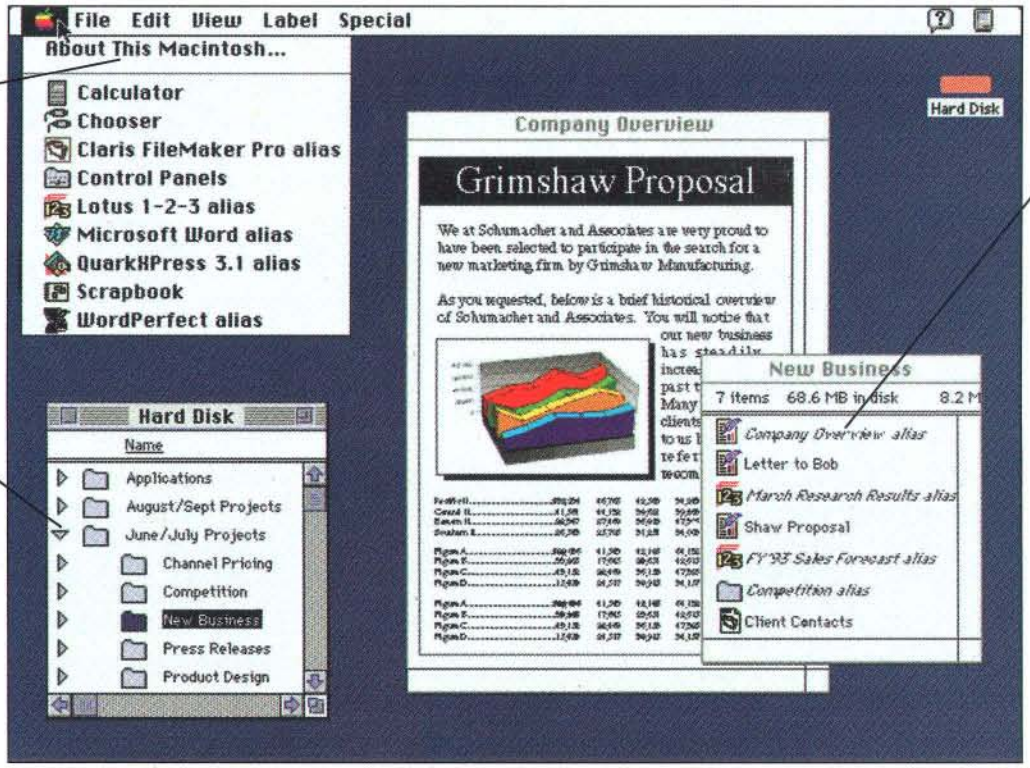
List price — The manufacturer's suggested retail price for the monitor.
Street price — The average price at dealers surveyed across the U.S. in March 1993 or through mail order.
Tube type — Whether the tube uses a shadow mask or a Sony Trinitron.
Dot pitch — The vertical distance, in millimeters, between adjacent phosphors of the same color. A smaller dot pitch provides a sharper image.
Screen size (diagonal) — The length, diagonally, of the exposed glass on the monitor, in inches.
Active-screen size (diagonal) — The length, diagonally, of the portion of the screen that displays an image, in inches.
Max. pixel dimensions (W x H) — The maximum number of dots (pixels) that can be displayed on the screen, counting horizontally (width) and vertically (height).
Horizontal-scan rate — The number of lines of pixels per second that can be written on the screen, in thousands of cycles per second (kilohertz). For the autosynchronous monitors, the minimum and maximum rates.
Vertical-scan rate — The rate, in cycles per second (hertz), at which the screen can be redrawn from top to bottom. For the autosynchronous monitors, the minimum and maximum rates.
Antiglare treatment — The type of coating applied to eliminate or diffuse reflected light on the monitor's screen.
Controls — Does the monitor have accessible controls for brightness, contrast, image position and size, pincushioning, and voltage? If so, the type (analog or digital) and the location of the control.
Cable/adapter included — Is a Mac II-series video cable and/or adapter included with the monitor?
Case dimensions (W x D x H) — The outside width, depth, and height of the monitor's plastic shell, in inches.

continues ▶

How to do an honest day's work by using an alias.

The new Apple menu allows you to easily access anything on your Macintosh—files, applications, desk accessories, control panels, whatever—by simply placing it in your Apple Menu Items folder.

The Outline View feature lets you examine files inside a folder without having to open up a new window. Clicking on this triangle creates a drop-down list of that folder's contents.



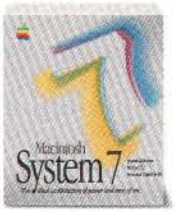
Creating an alias is a great way to organize your projects so that files and applications can be in several places at once. Click on the "Company Overview" alias here, for example, and you actually open the original file containing your proposal to Grimshaw.

Finding information fast with System 7.

System 7™ software comes with an array of new tools that makes accessing information on your Macintosh® easier and quicker than ever.

To begin with, you can create an "alias." Designed to help you better organize your hard disk, aliases are not full-fledged copies of files but, rather, small 2K "pointers" to files, folders and applications, which you can put in as many places on your Mac® as needed. When you click on an alias, you actually open the original—no matter where it's located.

The new Find feature lets you search for files, folders and applications, and then actually brings them right to the front of your desktop for you.



And with Outline View, simply clicking on the triangle to the left of the folder icon creates a menu list of its contents. So you never fill up your computer screen with multiple windows trying to find that buried file.

Of course, these are just a few of the ways System 7 can help make you more productive.

They're also just a few of the many reasons why 5 million Macintosh users are now working with System 7, as well as with the more than 6,000 applications available that run on it.

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14- and 15-Inch Color Monitors

Table 1: Features of 14- and 15-Inch Color Monitors

	▶ Apple Macintosh Color Display ♣♣♣♣	Apple Performa Display ♣♣	Apple Performa Plus Display ♣♣♣½
List price	$589*	NA†	NA†
Street price	$525	$305	$400
Pros	Good color quality. Good focus. Tilt/swivel stand.	Inexpensive. Good color quality.	Inexpensive. Good color quality. Good focus.
Cons	Tools required to adjust monitor are not included. No antiglare treatment.	Large dot pitch. Poor focus and sharpness. No antiglare treatment. No tilt/swivel stand.	No antiglare treatment. No tilt/swivel stand.
Specifications			
Tube type	Trinitron	shadow mask	shadow mask
Dot pitch	.26 mm	.39 mm	.29 mm
Screen size (diagonal)	12.75 in.	13.25 in.	14.25 in.
Active-screen size (diagonal)	11.5 in.	11.625 in.	11.625 in.
Max. pixel dimensions (W x H)	640 x 480 pixels	640 x 480 pixels	640 x 480 pixels
Horizontal-scan rate	35 kHz	35 kHz	35 kHz
Vertical-scan rate	66.7 Hz	66.7 Hz	66.7 Hz
Power consumption	55 watts	85 watts	85 watts
Tilt/swivel stand included	yes	no	no
Antiglare treatment	none	none	none
Controls			
Brightness/contrast	analog, front	analog, front	analog, front
Horizontal/vertical position	analog, back	analog, front	analog, front
Horizontal/vertical size	no	analog, back	analog, back
Pincushioning	no	no	no
120/240-volt switching	120V only	120V only	120V only
Other			
Cable/adapter included	yes/NA	yes/NA	yes/NA
Case dimensions (W x D x H)	13.5 x 16 x 13 in.	14 x 15.75 x 13 in.	14 x 15 x 12.75 in.
Swivel-stand area	12.25 x 10.5 sq. in.	NA§	NA§
Weight	27.1 lb	25.8 lb	25.4 lb
Warranty	1 year	1 year	1 year
Company	Apple Computer, Inc. 20525 Mariani Ave. Cupertino, CA 95014 800-538-9696 408-996-1010	Apple Computer, Inc. 20525 Mariani Ave. Cupertino, CA 95014 800-538-9696 408-996-1010	Apple Computer, Inc. 20525 Mariani Ave. Cupertino, CA 95014 800-538-9696 408-996-1010

*At press time, Apple had lowered the suggested list price to $539, which should result in a lower street price.

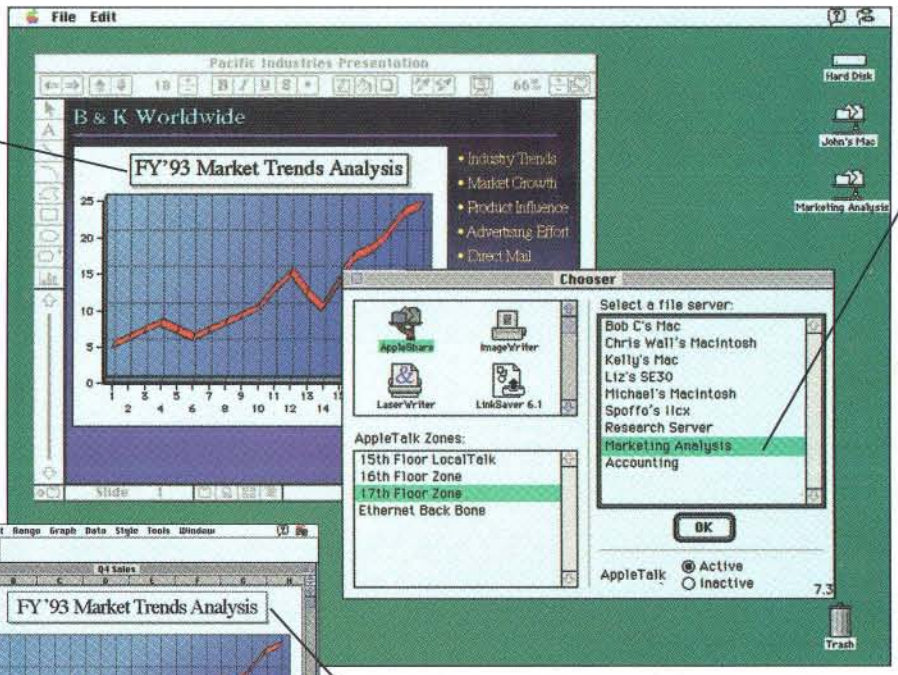
†At press time, Apple had decided to sell the Performa Display and Performa Plus Display only as part of a bundle with Performa computers.

§Tilt/swivel stand is not included. The monitor footprint is 11.25 x 12.25 in.

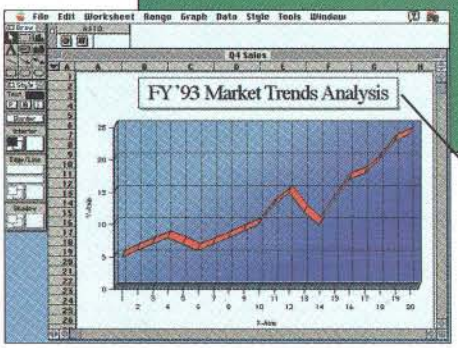
▶ *MacUser* Bottom Line pick

How to pull together 3 months of research in under a minute.

File sharing makes it easy for Macintosh users to exchange information and work together over a network. So, for example, you could pull this "FY '93 Market Trends Analysis" chart from your colleague's computer and incorporate it into your "B & K Worldwide Sales Report" in a matter of seconds.



Each Macintosh user determines which files are shared with which people. To access the chart on your colleague's Mac, you simply open the Chooser and select your colleague's file server or desktop computer name. Which, in this case, happens to be "Marketing Analysis."



You can give people access to your Macintosh and allow them either to change files or only look at them. In this example, your colleague has given you access to this "Market Trends Analysis" chart through a folder you both share on his Mac. You simply copy the chart into your presentation slide.

File sharing with System 7.

With System 7™ software and its built-in file sharing, putting together a presentation on your Macintosh® has never been easier or quicker. Even when the research you need for it is in someone else's computer.

Now, despite the fact that you and your colleagues may have different schedules, you can still collaborate on a project over your network. Because file sharing enables you to work with files on each other's computers.

You simply give your associates access to any designated file or folder on your Macintosh, and they can work with your data from their computers.

So let's say, for instance, that your boss walks into your office and asks to see where you're at with your quarterly research summary. But the June findings happen to be on your partner's Mac,® and she's out to lunch.

No problem. With file sharing, you can access your partner's data in moments.

Of course, this is just one of the many ways System 7 can help make you more productive.

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Table 1: Features of 14- and 15-Inch Color Monitors, continued

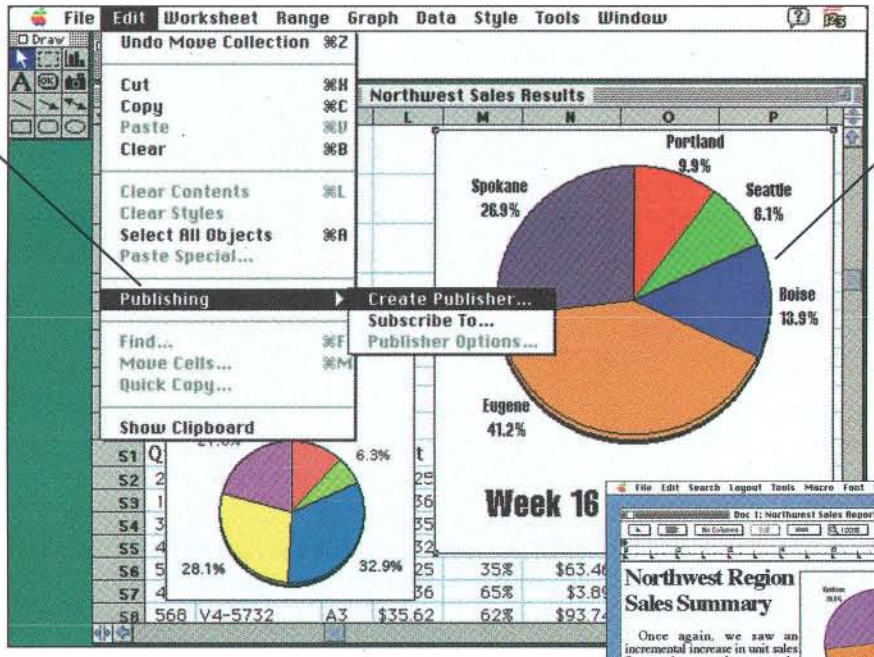
	Nanao FlexScan F340iW ♣♣♣½	Sigma Designs ColorMax 15 ♣♣♣	▶ Sony CPD-1430 ♣♣♣♣½
List price	$899	$899	$1,030
Street price	$750	$775	$650
Pros	Digital controls. Tilt/swivel stand. Autosynchronous monitor with multiple resolutions.	Tilt/swivel stand. Autosynchronous monitor with multiple resolutions. Includes PowerBook video adapter; Mac II-family video adapter available on request. Good documentation.	Excellent color quality. Good focus. Digital controls. Tilt/swivel stand. Autosynchronous monitor with multiple resolutions. Includes Mac video adapter.
Cons	Expensive. Mac video adapter is optional. Small color range.	Expensive.	Documentation doesn't mention the need for a Mac video adapter.
Specifications			
Tube type	shadow mask	shadow mask	Trinitron
Dot pitch	.28 mm	.28 mm	.25 mm
Screen size (diagonal)	13.75 in.	14.25 in.	13.25 in.
Active-screen size (diagonal)	13.75 in.	13.25 in.	13 in.
Max. pixel dimensions (W x H)	1,024 x 768 pixels	1,024 x 768 pixels	1,024 x 768 pixels
Horizontal-scan rate	27 – 61 kHz	30 – 64 kHz	28 – 58 kHz
Vertical-scan rate	55 – 90 Hz	50 – 100 Hz	55 – 110 Hz
Power consumption	100 watts	110 watts	100 watts
Tilt/swivel stand included	yes	yes	yes
Antiglare treatment	silicon coating	silicon coating	antireflective coating
Controls			
Brightness/contrast	digital, front	analog, front	digital, front
Horizontal/vertical position	digital, front	analog, front	digital, front
Horizontal/vertical size	digital, front	analog, front	digital, front
Pincushioning	digital, front	analog, back	digital, front
120/240-volt switching	120V only	120/240V switch	120/240V switch
Other			
Cable/adapter included	yes/no	yes/yes◊	yes/yes
Case dimensions (W x D x H)	14.4 x 16.25 x 15 in.	14.25 x 15.25 x 15 in.	13.75 x 16.25 x 14 in.
Swivel-stand area	10.25 x 10.25 sq. in.	12 x 12 sq. in.	9.5 x 9.5 sq. in.
Weight	36.6 lb	36.3 lb	30.4 lb
Warranty	1 year	1 year	1 year, monitor/2 years, tube
Company	Nanao Corp. 23535 Telo Ave. Torrance, CA 90505 800-800-5202 310-325-5202	Sigma Designs, Inc. 47900 Bayside Pkwy. Fremont, CA 94538 800-845-8086 510-770-0100	Sony Corp. of America 3300 Zanker Rd. San Jose, CA 95134 800-352-7669 201-930-7669

◊Comes with adapter for PowerBook; regular Mac II-family adapter available free on request.

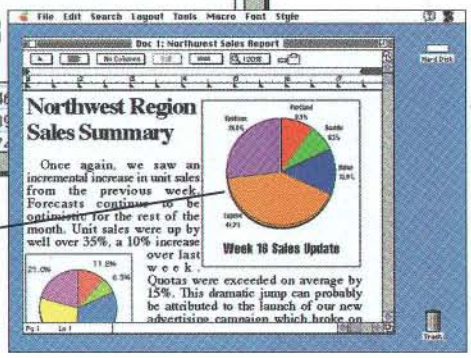
▶ *MacUser* Bottom Line pick

How to make sure your pies are always fresh.

System 7 lets you create "live links" between documents from different applications with a tool called Publish and Subscribe. By "Publishing" a chart from one document, you can "Subscribe To" it and place it in any number of other documents. When you update the original, all the other charts linked to it are updated automatically.



Select the item you want to publish – in this case, a pie chart in your spreadsheet. Go to the Edit menu and choose "Create Publisher." That's all there is to it. Now your chart is ready for you and others to subscribe to.



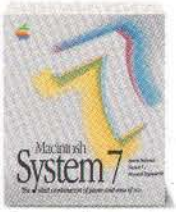
From your word processing document, select "Subscribe To" in the Edit menu, and you've placed a copy of the chart in your sales summary. When you make changes to the original chart, this new one will be updated automatically to reflect the changes.

Up-to-date documents with System 7.

With System 7™ software and a built-in tool called Publish and Subscribe, keeping reports and documents up to date is as easy as, well, you know what.

For instance, let's say you're working on a sales report in Microsoft Word. Let's also say that you've created a pie chart in a Lotus 1-2-3 spreadsheet showing your company's most recent sales results, and you want to include this chart in your final report.

Experience tells you, however, that these sales figures will continue to change right up to the very last minute.



No problem. With the Publish and Subscribe feature, you can publish the pie chart from your spreadsheet and then subscribe to it from within your word processing document.

This creates a "live link" between the two. Now, each time you revise the sales figures in your Lotus spreadsheet, the pie chart will automatically reflect the changes. So your final report will always be revised and up to date.

Of course, this is just one of the many ways System 7 can help make you more productive.

It's also just one of the many reasons why 5 million Macintosh® users are now working with System 7, as well as with the more than 6,000 applications available that run on it.

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And then see how System 7 can give you the power to keep all your ideas fresh. The power to be your best®.

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Accounting *for* Yourself

Trying to find the right accounting program for your business? Here's a practical guide to choosing small-business accounting software for the Mac.

Maybe you're an architect, an engineer, a printer, a cabinetmaker, or a baker. The one thing you *aren't* is an accountant. But don't let that stop you from doing your books on your Mac — there are plenty of programs specifically aimed at small-business owners that don't require you to have a CPA license to master them.

Of course, choosing the *right* program takes some time and trouble — you are trusting it to keep your finances in order and the IRS at bay, after all. And once you've selected a program, budget plenty of time for installing it and teaching yourself and your staff how to use it.

To help you in your search, we looked at ten accounting programs. The simplest programs are Teleware's Best Books 1.0, a new bookkeeping program that handles accounting basics and includes job costing but doesn't have inventory, purchase-order, or general-ledger features; and CheckMark Software's Cash Ledger 1.5, a simple cash-accounting package that is an ideal double-entry program for entering just your checks and deposits — the basics to give to your accountant.

BY MAIA CRAIG

DAILY CASH REC
SALE

More sophisticated are the midrange programs, which handle payables, receivables, and payroll and often include inventory and job costing. These programs are usually harder to install and use than entry-level products are and often require consulting help. We looked at eight midrange products: State of the Art's Accountant, Inc. 3.5.2, which has a multiuser version and handles job costing and inventory; Computer Associates' ACCPAC Simply Accounting 1.3, which has job costing and inventory; Software Developer's Consortium's Business Sense 2.0, which includes job costing and departments but has no inventory; CheckMark's MultiLedger 3.0, which has a multiuser version and includes inventory and job costing; Teleware's M.Y.O.B. 3.0, which includes inventory and job costing but lacks a payroll feature; Peachtree Software's Peachtree Accounting for the Macintosh 2.0 (PAM), which has inventory, job costing, departments, and divisions; Peachtree Software's Peachtree Insight 4.0, a modular system that has inventory, departments, divisions, and multiple equity accounts; and Satori Software's Satori Components, a modular system with job costing and time billing.

If you want a program that can be used by more than one person at the same time — one person writing checks while another is invoicing, for example — then you need a multiuser package. Accountant, Inc. and MultiLedger are available in multiuser versions. The need for such a program also may be a sign that you require a more complex program than those reviewed here (see the "Do You Need More Power?" sidebar).

All of these programs can handle most of the tasks an accounting program should perform: writing checks, keeping track of payables and receivables, performing bank reconciliations, planning budgets, and generating financial statements. Beyond these simple requirements, however, different types of businesses have different needs in accounting software. And accounting packages vary in their ability to meet these needs. How do you decide among them? A good place to start is by identifying your own business type: Is it service, retail, light manufacturing or wholesale, or nonprofit?

Service Businesses

Look for:

- Accounts receivable.
- Time billing or the ability to link to a time-billing program.
- Service invoices with enough room to describe services rendered.
- Job costing or project tracking.

Top picks for service businesses:

CheckMark's MultiLedger, for its straightforward accounting interface, stability, and link to Timeslips III; if you need departments or divisions for job costing, try Peachtree Accounting for Macintosh. If you have simple needs, Best Books, from Teleware, is easy to use and probably has all the features you need.

Service Businesses

Among the most common types of businesses that use a Mac are service businesses, such as architectural, graphic-arts, or accounting firms, all of which usually bill at an hourly rate.

Service businesses need a good accounts-receivable and billing system, which lets them write invoices and keep track of who owes them money. All the programs we looked at can do this except Cash Ledger (which is on a cash basis only). Something to look for, however, is how invoices are formatted. Most service businesses provide complex services and need a large enough description field to enumerate them in detail. The program should provide a *service invoice,* which gives you the space to describe your services in more detail than is available in an *item invoice* (see Figure 1). Accountant, Inc.; Best Books; MultiLedger; M.Y.O.B.; PAM; Peachtree Insight; and Satori Components all have useful service invoices — ACCPAC Simply Accounting and Business Sense do not.

Architects, lawyers, engineers, graphic artists, and

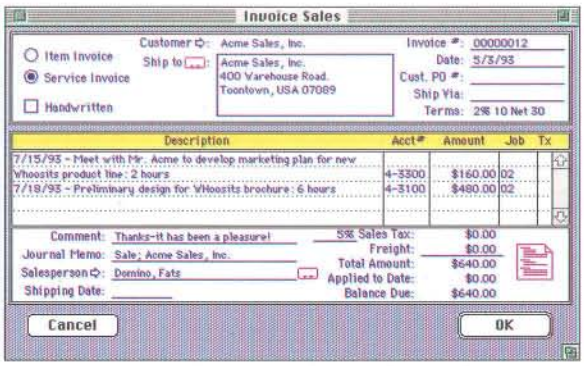


Figure 1: A good service invoice, like this one from M.Y.O.B., gives you room to describe services rendered.

contractors also need a program that provides *job costing,* or *project tracking,* a handy way of tracking income and expenses by clients, projects, or profit areas. Typically, you set up a job or project and then assign a job number to expense and income categories as you enter transactions. Accountant, Inc.; ACCPAC Simply Accounting; MultiLedger; M.Y.O.B.; and PAM offer this kind of job costing. Satori Components offers a stand-alone module called Job Cost/Time Billing that has far more detail and complexity than the other programs do.

Another way of tracking income and expenses by project is by setting up *departments,* or *profit centers,* within your chart of accounts. This requires you to add an extra digit or two to your main general-ledger account number to denote a specific project or area of business — if you want to differentiate between consulting and teaching, for example. By using departments, you see which parts of your business are profitable. Business Sense, MultiLedger, PAM, Peachtree Insight, and Satori Components all offer this option. You can add as many as 9 departments with MultiLedger; 99 with Business Sense, PAM, or Satori Components; and 1,000 with Peachtree Insight. (In case you have separate entities within your company — a business with one arm selling a product and another doing consulting, for example — PAM and Peachtree Insight let you set up *divisions.* This lets you avoid setting up two separate companies.) Accountant, Inc., although it does not have departments, or profit centers, per se, offers enough flexibility in its chart-of-accounts design to let you create departmental reporting; you just need to be a bit creative.

By using departments rather than the job costing offered by most programs, you can easily produce profit-and-loss statements for each department, as opposed to getting lists of all transactions associated with a job, as happens when using the job-costing functions in Accountant, Inc. and MultiLedger, for example. The drawback to using departments is that you can easily end up with a large chart of accounts that makes printing reports and looking up account numbers unwieldy.

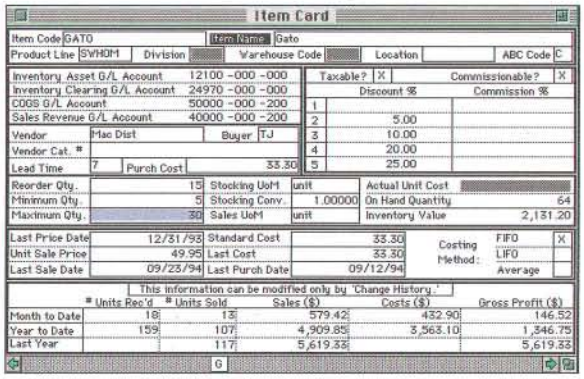
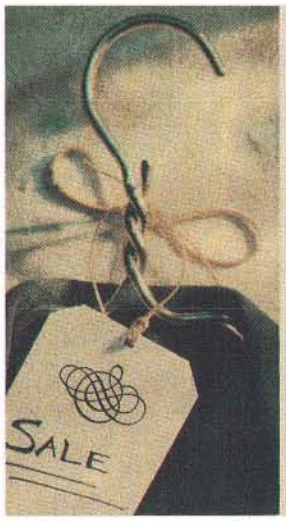


Figure 2: Inventory control is a vital aspect of a retail business. Peachtree Insight's item-setup screen is rich in detail.

A big part of most service-based businesses is billing — the ability to track time by client, project, or job so that you can charge accurately for your services. Most accounting programs do not keep track of the time you spend on a particular job (except Satori Components, with its Job Cost/Time Billing module), but you can get around this problem by using programs that link time billing to your regular accounting system. Timeslips III ($299.95), from Timeslips Corp. (508-768-6100), lets you fill out a "slip" with your time charged to a client, listing the activity or expense to be billed. Timeslips III gives you a variety of reports in return. In addition, Timeslips has developed a link, called TAL (Timeslips Accounting Link), with many

Accounting packages vary in their ability to meet specific needs.



Retail Businesses

Look for:

- Inventory control.
- Purchase orders.
- Sales tracking, including point of sale if you need it.

Top picks for retail businesses:

M.Y.O.B., from Teleware, is a good all-around choice: It's easy to use, powerful, and lets you link to CheckMark and Aatrix payroll programs. If you want to link directly to a point-of-sale package, Accountant, Inc., from State of the Art, is an acceptable choice, although it's more difficult to set up and use.

popular accounting packages. When using TAL, Timeslips III does your invoicing and keeps track of your billings to clients, sending summaries by client to your accounting program. Timeslips offers links to Accountant, Inc.; ACCPAC Simply Accounting; MultiLedger; PAM; and Peachtree Insight. A link with M.Y.O.B. should be available by the time you read this.

Light Manufacturing or Wholesale

Look for:

- Inventory control with item assembly.
- Purchase orders.
- Sales tracking.
- Custom invoices.

Top picks for light manufacturing or wholesale:

M.Y.O.B., for its ability to handle inventory assembly, purchase orders, quotes, and commissions without making you tear your hair out. It lacks payroll, however. If you need that feature, check out Accountant, Inc.

Retail Businesses

If you run a store, you'll need an inventory-control system, such as the one available in Accountant, Inc.; ACCPAC Simply Accounting; MultiLedger; M.Y.O.B.; PAM; and Peachtree Insight. This system lets you keep track of such things as your costs, selling prices, vendors, and inventory, and it warns you if you fall below preset minimum levels of stock. When you're checking out programs, look at inventory-item setup to see what kind of detail the package can handle. Also look at the inventory reports offered. Decide what reports you'll need (profit per item, stock for particular items, and so on), and make sure they're in the program. Pulling out data to compile your own reports is difficult and time-consuming.

Peachtree Insight offers the most item detail for setting up inventory (see Figure 2), with Accountant, Inc.; M.Y.O.B.; and PAM following closely. M.Y.O.B. is the simplest to use.

If you need purchase orders (to keep track of your purchases and to comply with some vendors' needs), Accountant, Inc.; M.Y.O.B; and PAM are your choices. However, PAM's purchase-order option is located in inventory instead of payables, which is confusing.

If you want to track sales by salesperson, you can do so with Accountant, Inc.; Business Sense; MultiLedger; M.Y.O.B.; Peachtree Insight; and Satori Components — but not with PAM. MultiLedger and Peachtree Insight can keep track of gross profit by salesperson; Peachtree Insight and Satori Components can also calculate sales commissions and set up territories. Satori Components calculates commissions by either sale or receipt of payment. If you employ a lot of salespeople, be sure to check that the accounting package you choose can handle the number you need to track.

Point of sale (being able to track a sale as it happens, such as at a cash register) is a specialized need that is not usually available in entry-level or even midrange packages. However, you can link Accountant, Inc. with POSIM, from Ensign Systems (801-546-1616), a point-of-sale package that handles all inventory functions, with Accountant, Inc. doing the rest. POSIM costs $695 to $1,795, depending on configuration. You can import POSIM inventory records into Business Sense, and Ensign plans to develop links with other packages as well. An interim solution is to enter the cash-register summaries into your accounting system manually. PAM has a feature that lets you easily set up automatic journal entries for this sort of need.

Light Manufacturing or Wholesale

Most of the features that are important for retail businesses are also vital for anyone involved in light manufacturing or wholesale. In fact, if you are doing light manufacturing — building furniture, for example

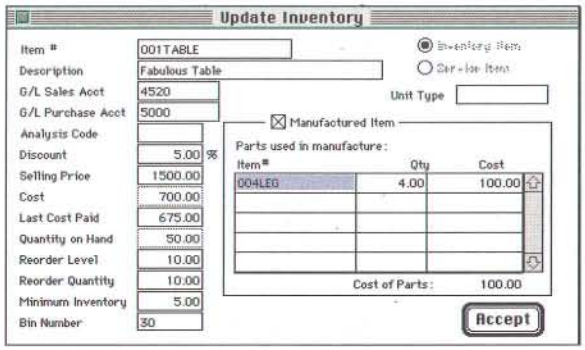


Figure 3: Manufacturers need inventory-assembly capabilities: Accountant, Inc. lets you list the subitems needed to assemble an item such as a table.

— the inventory-control portion of the package is especially critical, because the inventory system *must* be able to handle the assembling of items. Accountant, Inc.; M.Y.O.B.; and PAM do a good job of handling inventory assembly by allowing you to list items that go into an assembly and then doing the transfer work for you (see Figure 3). ACCPAC Simply Accounting, MultiLedger, and Peachtree Insight are not set up to handle this easily. Peachtree Insight is a good choice, however, if you have various locations for your inventory, as long as you are not also assembling items.

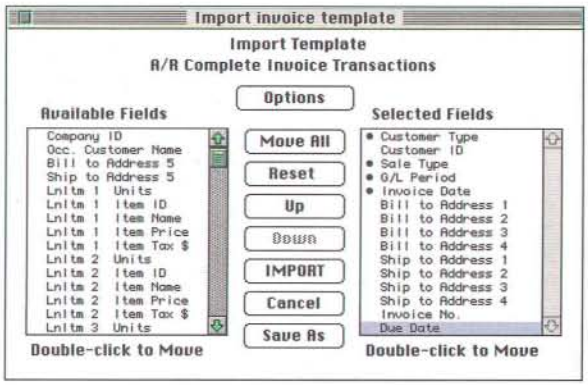


Figure 4: PAM's Import/Export utility lets you import invoices into its accounting system from a database or spreadsheet program.

Invoicing is another important consideration. You should look at the invoicing formats of these programs and see if you can customize their standard forms. Some common parts of an invoicing format are fields for shipping method, terms, salesperson, customer purchase order, and discounts. Accountant, Inc.; Best Books; MultiLedger; M.Y.O.B.; Peachtree Insight; and Satori Components meet these requirements. PAM has none of these fields. Satori Components is the most flexible. An alternative to customized forms is offered by Accountant, Inc., which uses Apple events to link to Informed Manager ($195; you also need Informed Designer, $295, to design forms), from Shana Corp. (403-463-3330). However, the ability to customize the standard forms in Accountant, Inc. is limited compared with that of MultiLedger, M.Y.O.B., PAM, and Peachtree Insight. As other programs are built with support for database Apple events, they'll be able to use Shana's programs as well.

If you want to turn customer quotes into invoices, Accountant, Inc. and M.Y.O.B. will meet your needs. Accountant, Inc. has the advantage here, because it lets you reuse quotes for different customers.

Sometimes light-manufacturing and wholesale businesses have specialized needs or have a high transaction volume (invoices with more than 100 items, for example) that can be effectively handled only by a more complex software package. If you think that might be the case with your business, see the "Do You Need More Power?" sidebar.

Nonprofit Organizations

A nonprofit organization — a museum retail store, for example, or a group that builds low-cost housing — can fall into any of the above business types and have all the needs of businesses in those categories. But nonprofits also have accounting requirements of their own. For example, they must keep track of fund balances, with each fund having its own equity account that carries balances forward from year to year. Most entry-level and midrange packages automatically close income and expense accounts to one equity account. Peachtree Insight, however, lets you have an equity account for each profit center you set up, as many as 1,000 in all.

Nonprofit organizations also have to be able to generate financial reports for different funds or departments. PAM offers income statements by department; Peachtree Insight and Satori Components each offer income statements by both department and profit center. If you need to keep track of many funding sources, Peachtree Insight is the best choice, because this program can handle divisions, departments, and multiple

When You Need Help

Because choosing an accounting program is an important business decision, get as much advice as you can before you make your choice. Talk to friends and colleagues, and consider consulting a Mac accounting specialist — even an hour of consulting time is worth it. One way of finding a consultant is by contacting the Macintosh Accounting Consortium (MAC), at 408-377-1144. MAC is a nonprofit group partially funded by Apple and dedicated to helping small- and medium-sized businesses with their accounting programs. If you're attending Macworld Expo in Boston this month, stop by MAC's booth at the show.

You can also call the software companies directly and request the names of their qualified installers. Qualified installers have been tested and certified by the company and are knowledgeable about accounting and the company's product. Accountant, Inc., and CheckMark's MultiLedger have directories of qualified installers in their packages. Most Mac accounting specialists are qualified installers for several packages and can give you a good overview of what each package offers.

equity accounts. A drawback is that Peachtree Insight is harder to learn and install than PAM is.

Nonprofits often have a donor database, so you may need to find an accounting package that can be linked to a database program for easier revenue reporting. Although most packages offer import/export features, we found PAM's separate Import/Export utility ($169) was the best, because it lets you import entire transactions (see Figure 4). Peachtree Insight and Satori Components also offer good import/export features. The worst package in this regard is Accountant, Inc., which doesn't let you import financial data, only vendors, customers, and so on. Accountant, Inc. does take full advantage of System 7's publish-and-subscribe, which lets you establish a link between your accounting package and other software — a spreadsheet or database program, for example. As convenient as it is to be able to link to other packages, it isn't painless, and you'd probably need a consultant to help you.

Nonprofit Businesses

Look for:

- Support for multiple equity accounts.
- Financial reports by department.
- Links to your database programs.

Top picks for nonprofit businesses:

Peachtree Insight, with its ability to handle as many as 1,000 funds with flexible reporting and its separate equity accounts, is a good choice. If you have simpler needs, Peachtree Accounting for the Macintosh also has departments and divisions but is less complicated to set up and use.

Business Basics

There are certain things *every* business needs from its accounting package — payroll, an easy-to-manage installation procedure and interface, and reports.

Payroll. Most companies need some sort of payroll system, at least to code payroll checks into the system after the payroll has been calculated. All accounting packages allow you to code payroll checks after the fact, either by entering the checks individually or by using journal entry. Full payroll functions that allow you to calculate and write payroll checks, with tax tables updated annually (for a fee), are available in Accountant, Inc.; Business Sense; MultiLedger (through CheckMark's Payroll, a $295 program you can link to it); PAM; and Peachtree Insight. Teleware plans to add payroll capabilities to its next upgrade of M.Y.O.B.

CheckMark's Payroll, PAM, and Peachtree Insight can handle pretax deductions such as for 401K plans. And CheckMark's Payroll has a screen that lets you enter several employees' hours at once, which makes it easy to enter variable hours by employee (see Figure 5). You can also calculate sales commissions. Both Accountant, Inc. and M.Y.O.B. can be linked to CheckMark's Payroll.

Another way to add payroll functions to M.Y.O.B., Best Books, and other accounting programs is through PayCheck ($79), Payroll ($199), or Ultimate Payroll ($399), from Aatrix (701-746-6801).

Installation and Interface. If you haven't been able to narrow your choice to one accounting package that can handle your business' basic needs, your decision may come down to which program is easiest to install or which interface you prefer.

For nonaccountants, Teleware's Best Books and M.Y.O.B. are the easiest to install and use, with graphical flowchart menus organized by task. ACCPAC Simply Accounting, Business Sense, PAM, and Peachtree Insight all have tool palettes to help you wend your way through the accounting functions. Peachtree Insight comes in modules you have to connect to each other, however, and takes longer to install than the others do, usually requiring the help of a consultant.

If you choose Accountant, Inc., and want to take advantage of its links to other programs (CheckMark's Payroll, POSIM, or Informed Manager), you will need a consultant to help you establish these links. In addition, the required accounts of Accountant, Inc. are awkward (you can't customize names of accounts) and data entry is not as easy as in M.Y.O.B. or PAM.

ACCPAC Simply Accounting and Business Sense

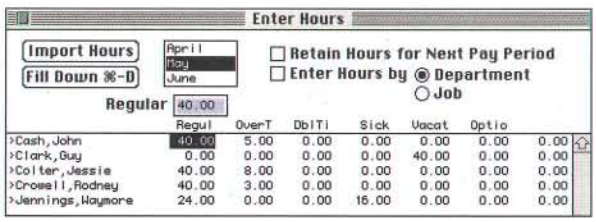


Figure 5: CheckMark's Payroll — which has links to several programs — lets you enter hours for many employees in one screen and retain them for the next pay period.

are the least sophisticated programs in terms of interface and flexibility. For example, in ACCPAC Simply Accounting, you can't void a check; everything has to be reversed or corrected by a journal entry. Business Sense has a spreadsheetlike interface, leaving debits and credits visible. An accountant would probably feel comfortable with the interface, but it could be confusing for nonaccountants.

Your decision may come down to which program is easiest to install and use.

MultiLedger and Cash Ledger offer straightforward, noniconic interfaces that closely resemble the general ledger familiar before the age of accounting on the computer. Accountants will find the interface easy to use; nonaccountants might be intimidated.

Satori Components, which includes General Ledger, Accounts Payable, and Accounts Receivable modules (all sold separately), requires a consultant to help you with setup decisions. It's fairly easy to use once it's been set up, however.

Reports. Reports are a key feature of any accounting package. All that time you've invested in installation, training, and data entry should culminate in meaningful reports for your business. Even if the information you need is in a program, it won't be of much use to you if you can't access it in a report.

The best of the bunch for reporting is Satori Components, which has an advanced report writer with which you can design reports by accessing fields within the program. Peachtree Insight is not quite as flexible, but it lets you format a variety of reports. The drawback of these systems is the time and effort required to format the reports. PAM allows some formatting and is much easier to use than Satori Components or Peachtree Insight is, but it's not as flexible.

The remaining packages have preformatted reports. MultiLedger's reports are clear (your accountant will love them). Accountant, Inc. provides a variety of reports, but you will have trouble getting a simple income statement to fit on a page.

Whatever kind of business you have, analyze your needs before you make any decisions. Make a list and check it twice — or three or four times — and you will find your search for an accounting program much less overwhelming and confusing.

Maia Craig is owner of the Berkeley, California, accounting firm Checks and Balances and a qualified installer for most Mac accounting packages.

Do You Need More Power?

- ❑ Do you have more than ten employees?
- ❑ Do several people need to be able to use your accounting program at the same time?
- ❑ Do you use both Macs and IBM-compatible PCs?
- ❑ Do you operate out of several locations?
- ❑ Does your business involve heavy manufacturing?
- ❑ Do you need a program that can handle point of sale or order entry?
- ❑ Do you have a high transaction volume? For example, do you generate invoices with more than 100 items?

If you answered yes to any one of the above questions, you may need a more complex program than those discussed in the main article. High-end accounting programs can be used by more than one person at the same time and are usually modular, which makes them more flexible and full-featured than entry-level programs are. Of course, all that sophistication means they require more installation and training time, and they cost more — sometimes a lot more. But if your business is growing rapidly, it's a good idea to invest in software that will grow with you.

Currently, the most popular high-end accounting product on the Mac is Great Plains Accounting, from Great Plains Software (701-282-4826). It's modular, has multiuser capabilities, and can handle most high-end accounting needs with its many modules. Prices range from $295 to $995 per module.

Flexware, from Flexware (916-581-6999), and SBT Database Accounting Library, from SBT Corp. (415-331-9900), are two other high-end packages for the Mac. Flexware has 13 modules — including sales-lead tracking — each of which costs around $895. SBT has 6 modules, each of which costs $695. Both programs are available in multiuser versions.

Three new products are Dynamics, from Great Plains Software (now available), Visual Accounting, from RealWorld (available soon), and Momentum, from State of the Art (also available soon).

You can buy Dynamics 1.0 in pieces, adding complexity as your business grows. For example, the Purchasing series includes Payables Management, which covers basic payables functions. If you need further complexity, you can order Receiving, the next piece in the Purchasing series, which handles purchase-order processing. Macs and Windows-based PCs can access the same database over the network. Fifteen modules, costing anywhere from $395 to $995, will be available by the end of 1993.

RealWorld (603-224-2200) is a PC developer that has branched into the Mac market, with Visual Accounting. Of the 12 modules that make up the program, the General Ledger and System Manager modules should now be available, with Accounts Receivable, Report Writer, and Accounts Payable expected soon. No prices were available at press time.

State of the Art (714-753-1222), which sells the midrange program Accountant, Inc., is also entering the high-end Mac market, with Momentum, a cross-platform program comprising 21 modules, none of which had shipped at press time. The first modules will be Accounts Payable, Accounts Receivable, General Ledger, and Library Manager.

continues ►

Table 1: Accounting-Program Checks and Balances

	Accountant, Inc. 3.5.2 ‡‡‡½	ACCPAC Simply Accounting 1.3 ‡‡‡	Best Books 1.0 ‡‡‡‡	Business Sense 2.0 ‡‡‡	Cash Ledger 1.5 ‡‡‡½
List price	$595 (single user) $1,195 (multiuser)	$199	$99	$395	$195
Pros	Takes advantage of System 7. Offers links to other packages. Good multiuser version.	Straightforward interface. Good job costing.	Easy-to-use graphical interface. Organized by task. Easy to install.	Simple documentation. Good sales-tax coding.	Good cash-based system. Stable, dependable. Clear reporting.
Cons	Rigid required-account structure. Limited payroll feature. Data entry could be faster.	Lacks flexibility. Easy to outgrow.	No integrated payroll or inventory. Better suited for home or simple business bookkeeping.	Cumbersome payroll.	No payables or receivables. Nongraphical interface.
Company	State of the Art, Inc. 56 Technology Irvine, CA 92718 714-753-1222 714-753-0374 (fax)	Computer Associates One Computer Associates Plaza Islandia, NY 11788 516-342-5224 516-342-5329 (fax)	Teleware, Inc. 300 Roundhill Dr. Rockaway Beach, NJ 07866 201-586-2200 201-586-8885 (fax)	Software Developer's Consortium 6070 South 1300 East Salt Lake City, UT 84121 801-288-2216 (voice and fax)	CheckMark Software 1520 E. Mulberry Ste. 200 Fort Collins, CO 80524 303-484-3541 303-484-0429 (fax)

Table 1: Accounting-Program Checks and Balances, continued

	MultiLedger 3.0 ‡‡‡½	M.Y.O.B. 3.0 ‡‡‡‡	Peachtree Accounting for the Macintosh 2.0 ‡‡‡½	Peachtree Insight 4.0 ‡‡‡½	Satori Components General Ledger 1.02, Accounts Payable1.04, and Accounts Receivable 1.04 ‡‡‡½
List price	$395 (single user) $695 (multiuser)*	$199	$169	$395	$795 each
Pros	Stable, dependable system. Great interface for accountants. Clear reporting.	Easy-to-use graphical interface. Organized by tasks. Easy to install. Has power of more-complex programs.	Good, comprehensive package. Good payroll module. Flexible reports. Has departments and divisions.	Full-featured. Flexible reports.	Good stand-alone job-costing/time-billing module is available for $1,495 (includes accounts receivable). Flexible reports.
Cons	No inventory assembly. Interface difficult for novices.	No integrated payroll.	Invoices lack detail.	Should be multiuser to go with its power. Complicated to install. No inventory assembly.	Difficult to set up. No inventory or payroll.
Company	CheckMark Software 1520 E. Mulberry Ste. 200 Fort Collins, CO 80524 303-484-3541 303-484-0429 (fax)	Teleware, Inc. 300 Roundhill Dr. Rockaway Beach, NJ 07866 201-586-2200 201-586-8885 (fax)	Peachtree Software, Inc. 1505 Pavilion Pl. Norcross, GA 30093 404-564-5800 404-564-5888 (fax)	Peachtree Software, Inc. 1505 Pavilion Pl. Norcross, GA 30093 404-564-5800 404-564-5888 (fax)	Satori Software 2815 Second Ave. Ste. 295 Seattle, WA 98121 206-443-0765 206-728-7068 (fax)

*MultiLedger's multiuser package is version 2.0.

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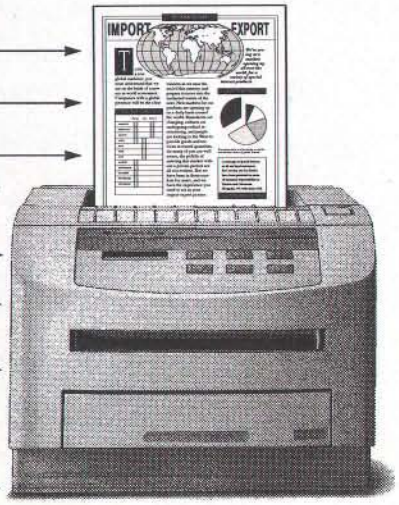

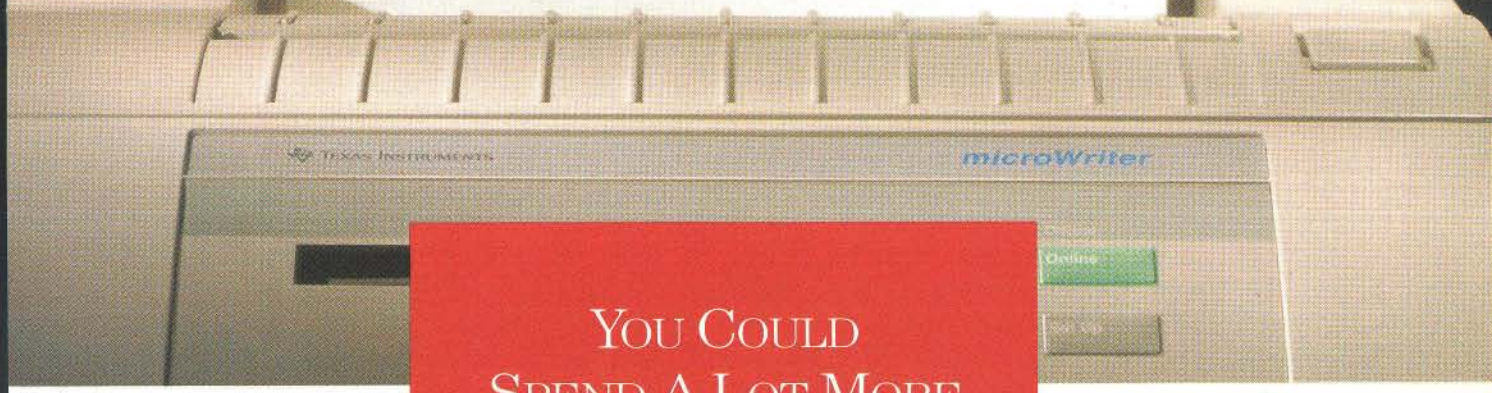

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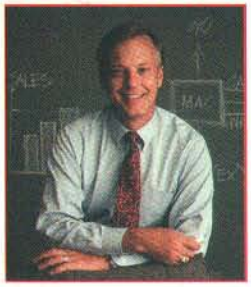

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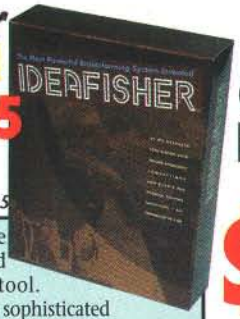

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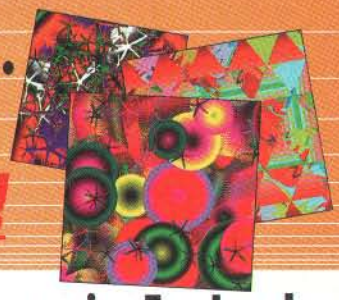

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Q900923	"EtherMac II-C(AUI, 10BT,BNC,64K)"	Farallon	$198
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Q901941	SCSI-Ethernet 10BASET Mac PowerBook Adaptor	Asante	$249
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Q98200	3.5" DSDD Colored	Inmac	$0.75 ea.	$0.63 ea.
Q79400	3.5" DSHD	Inmac	$1.07 ea.	$0.92 ea.
Q98201	3.5" DSHD Colored	Inmac	$1.17 ea.	$0.95 ea.
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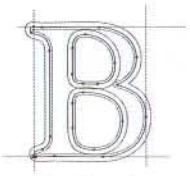

Blend two fonts to create a third. Time taken to create: 2 minutes Keystrokes required: 5

abcdefghijklmnopqrst
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LMNOPQRSTUVWXY
Z1234567890!@#$%^&
*()+?

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Fontographer always opens a copy of your existing font, keeping your original intact.

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Here's one we recently added to this font: our ★★★★½ review rating from *MacUser*. According to *MacUser's* Bruce Fraser, Fontographer is the *"tool of choice for creating fonts on the Macintosh."*

Fontographer's straightforward interface means you can be creative without being confused.

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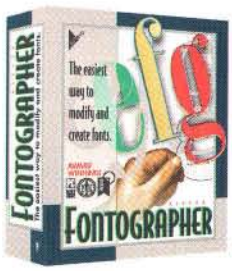

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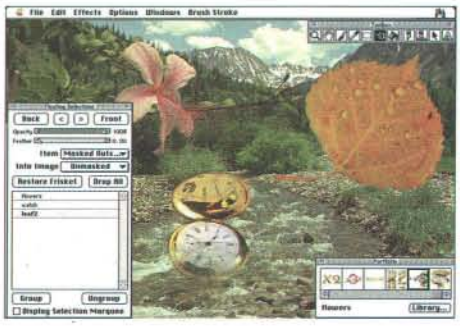
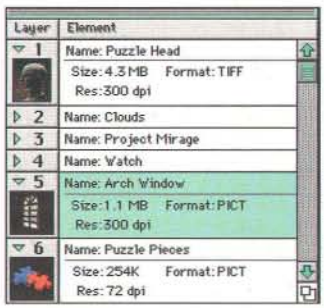


FITS and starts: How'd you like to work on humongous high-resolution color scans (we're talking 100+ megabytes here) in real time? If that sounds too good to be true, check out Live Picture, a color-retouching program from Paris-based Advanced Imaging (011-331-4524-3304 or 011-331-4524-6394 [fax]). Based on a new technology called FITS (Functional Interpolating Transformation System), Live Picture lets you **manipulate images in seconds.** How? Instead of operating on a copy of the image held in RAM (which bogs down your system), FITS records editing functions in layers of mathematical equations on files converted to a special format called IVUE. The image data itself is untouched until final processing as TIFF, EPS, or another common format. This approach allows for an infinite number of brush sizes and **unlimited undo.** Starting at $3,000, Live Picture isn't for everyone. But several companies (guess which ones) are interested in licensing FITS for their products. Stayed tuned. ✱ Closer to home, the folks of Infini-D have come up with Collage, a photocomposition program that operates on a similar principle. Dubbed an object-oriented Photoshop, Collage lets you work on proxies, or high-resolution screen versions, of TIFF or PICT images, which are placed in individual frames or layers comparable to those in QuarkXPress. After manipulation, the final image is rasterized in a process that Specular likens to rendering a wire frame in a 3-D program. Collage is less sophisticated than Live Picture, but it's more accessible and priced at less than $400. 413-549-7600. ✱ One of the cool things about object-oriented graphics is moving stuff around with a click-and-drag. Painter/X2, a plug-in for use with Fractal Design's Painter, turns any element into a **perennial floating selection** with all attributes attached. It's beyond spiffy. 408-688-5300. $149.



Beautiful backgrounds: Do you yearn to put mountains of moss, bales of baguettes or **piles of pots** into your designs? Letraset's Phototone Digital Selector gives you 568 background images and textures to choose from on a $129 CD-ROM. Export the 72-dpi file for image placement in comps, then order high-resolution transparencies with unlimited reproduction rights for $199 each. The Phototone Digital Selector package has 160 screen fonts, but you must order the printer fonts. Convenient, no — but the image quality and unique type designs make it worth a look. 201-845-6100.

By Pamela Pfiffner

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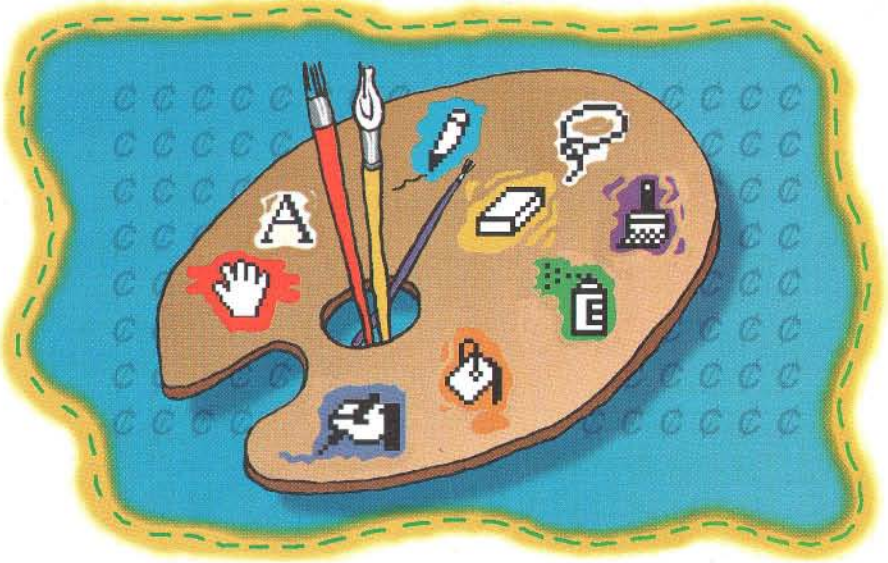

Six color paint programs whose price tags won't put you in the red or make you blue.

By Gregory Wasson

The first color paint programs for the Mac were expensive and hard to learn — you almost needed to be a professional graphic artist to make effective use of them. Today's high-end programs, such as Adobe Photoshop and Fractal Design's Painter, are even more complicated to master. (Isn't a mask something to wear for Halloween?) That's great for people with talent, time, and money to burn, but what about the rest of us poor schmucks who just want to dabble and finger-paint, as it were? We don't need all the advanced tools in the high-end paint products, and we certainly don't want to pay for them!

Fortunately, you no longer have to be a Midas or a Rockefeller to paint in color. With the Color Classic leading the way, color Macs are now affordable, and inexpensive color paint programs are popping up like wildflowers. We looked at six of these programs — Color MacCheese, from Delta Tao Software; DeskPaint, from Zedcor; Easy Color Paint, from MECC; Expert Color Paint, from Expert Software; Paint It!, from Timeworks; and UltraPaint, from Deneba Software — each with a suggested retail price of less than $100 and a street price that's lower still (see Table 1).

Although we expected these programs to offer minimal functionality, we were surprised at the high degree of sophistication in some of them. If you are on the verge of shelling out the bucks for a high-end program, you may want to take a test run with Color MacCheese or Expert Color Paint, for example. The hit on your pocketbook will be minimal, and you'll learn what to look for when shopping for the big-ticket items. And if you're more paint-by-number than Picasso, one of these six programs should be all the palette you'll ever need.

Cheesy Paint It Ain't

Color MacCheese might seem an unlikely name for a 32-bit-color paint program, but it's part of this product's irresistible charm. Color MacCheese is simplicity incarnate, at the same time offering an excellent mix of customary and unusual tools for budding artists. The usual shapes (polygon, circle, rectangle, and so on) are there, along with such goodies as a magnifier for zooming and a line tool.

But Color MacCheese also gives you some sophisticated painting tools you might not expect to see in a low-end application: anti-aliasing (smoothing) of text and objects; an eyedropper for selecting colors; a rake (for scattering pixels); a water-drop blur tool; and the delightfully named transmogrifier, which texturizes solid colors (see Figure 1). You can set transparency for tools, set dithering options for mimicking 32-bit (16.8 million) colors on a monitor that's capable of displaying only 16 colors, and even render simple 3-D objects.

You'll also find some advanced features tucked inside certain tools. Creating gradient fills, for example, requires just

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a couple of clicks and drags with the paint-bucket tool. Double-clicking on most of the other tools enables you to set various options.

Color MacCheese can export files in a variety of formats besides its own: MacPaint, TIFF (uncompressed), PICT, and StartupScreen.

Although it's primarily a color program, it can handily serve as a superior substitute for MacPaint in a black-and-white environment.

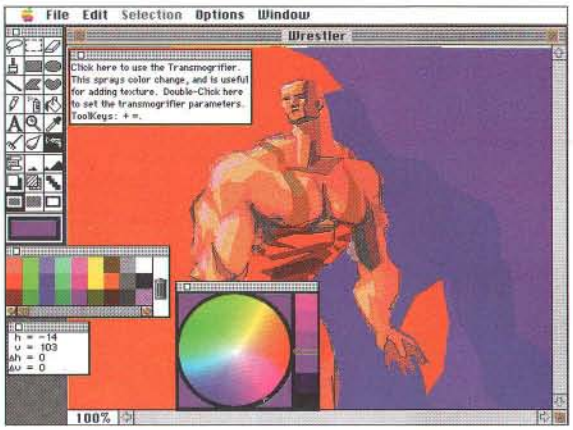

Figure 1: Its playful name implies fun, but Color MacCheese is a powerful program with a host of innovative tools. The transmogrifier tool, for instance, lets you add texture to solid colors.

This program invites playful exploration in the same way the original MacPaint did. In fact, Delta Tao, the innovative gang responsible for the program (and other, more advanced graphics applications such as Monet and Zeus as well as the nifty games Strategic Conquest and Spaceward Ho!), left the manual skimpy on purpose (there is an on-line help system).

Slim documentation can really hurt a program, but in this case, Color MacCheese is so inherently friendly that a manual is almost a waste of paper. Another nice touch is that the program is packaged in a space- and tree-saving CD-ROM jewel box.

Dynamite Deal

DeskPaint is always bundled with DeskDraw, so you'll end up with two programs if you opt for Zedcor's popular paint program. And at $29.95 for the two of them (if you order directly from the manufacturer — it's $199.95 otherwise), it's hard to say no to this deal.

DeskPaint comes in both DA and application versions, so even System 6 users without MultiFinder can enjoy the luxury of working with DeskPaint while using another application.

DeskPaint includes a complete set of painting tools (see Figure 2). The pencil, paint bucket, spray can, eraser, and even charcoal pencil can perform graphic magic in a variety of resolutions — in color, gray-scale, or black-and-white. The program can open and save in MacPaint, PICT, and TIFF (including compressed TIFF) formats. Transformation tools let you rotate, flip, and scale any selected portion of the current image.

You can edit at several

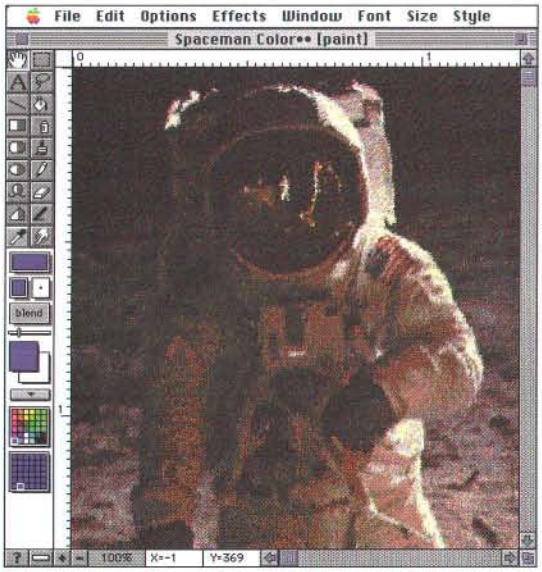

Figure 2: DeskPaint offers special-effects filters along with a full complement of painting tools. It really shines when you're touching up scanned images on the fly. It's also a great deal.

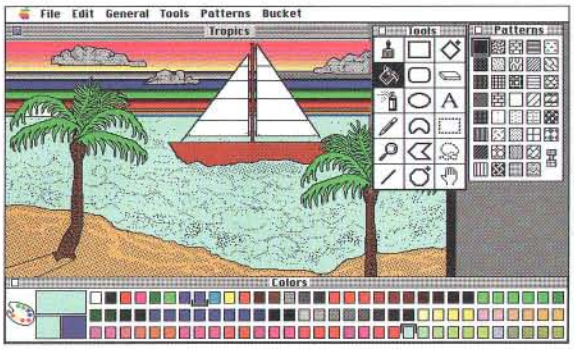

Figure 3: Easy Color Paint is aimed mostly at children but may offer enough painting power for some adults. A special shape tool enables you to draw preset figures such as crosses, wedges, and diamonds.

magnification levels. The most astonishing thing about DeskPaint is the degree to which it can serve as a faux Photoshop if you are dealing with scanned grayscale or color images. It's great for making on-the-fly adjustments to this kind of material. You can apply special-effects filters (Oil Painting, Mosaic, Trace Edges), smudge, lighten or darken, create simple masks, apply transparent gradient fills, and create portraits with diffused edges.

The program also features basic image-control capabilities (brightness and contrast).

In its debit column, DeskPaint seems sluggish at times compared with the other programs here, and its documentation has not kept pace with the latest version: What you read in the manual is not necessarily what you get in the program. DeskPaint is also one of the more complex and difficult programs among this group of six.

Over Easy

MECC's Easy Color Paint aims at ease of use and is targeted especially at children (it comes with "coloring books" — images youngsters can colorize on-screen) and the education market. But a competitor to Brøderbund's KidPix it isn't. Easy Color Paint offers a generally prosaic and staid approach to painting — which isn't bad, really, but does lack the playful charm of either Color MacCheese or KidPix.

Despite the product's emphasis on kids, it boasts enough in the way of real painting tools and capabilities that adults with simple expectations or minimal graphic needs might find it practical. The basic painting and selection tools are all there (see Figure 3), and you can use menu commands to modify the action of some tools. For example, the paint bucket fills with gradient blends if you set the appropriate option.

The color palette can display as many as 256 colors, either simultaneously or divided into three palettes through which you cycle. A helpful variant of the polygon tool, called Polygon Plus, lets you

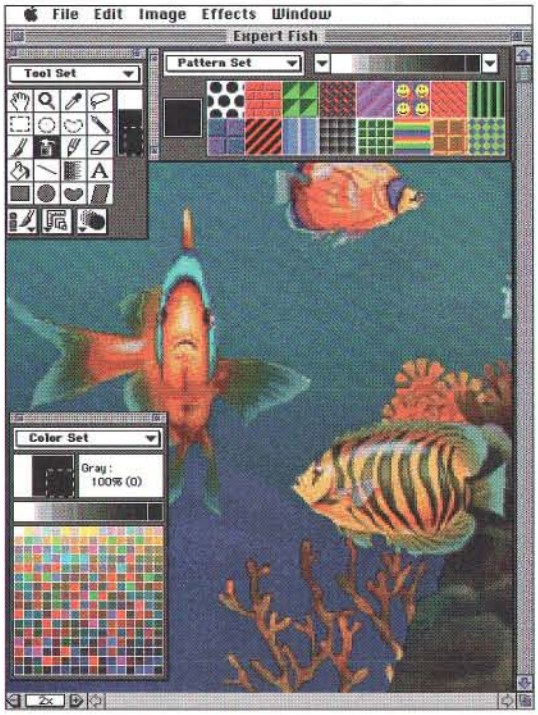

Figure 4: Expert Color Paint's great balance of tools and simplicity makes it a winner. But it's surprisingly sophisticated — you can define custom tool sets, with unique attributes for each tool.

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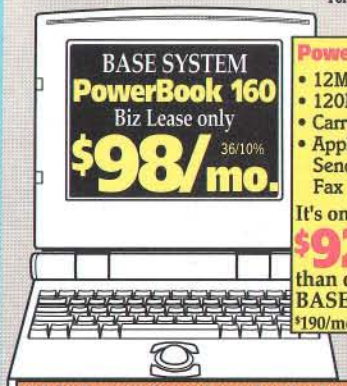

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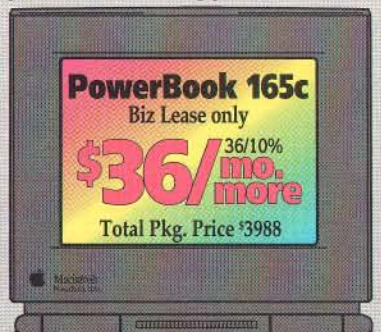

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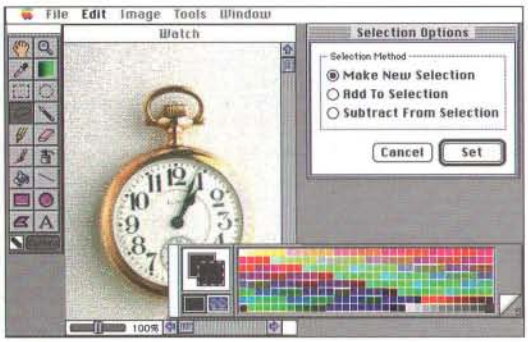


Figure 5: Paint It! is a well-designed paint program with an uncluttered interface that combines color and pattern palettes in a single, floating window. Double-clicking on a tool brings up optional settings for that tool.

specify the number of sides the shape should have. Another special tool lets you instantly create some set shapes such as a cross, a wedge, and a diamond. Using the eyedropper tool, you can subtract areas from your current selection and pick up color from the image. The program also provides the basic transformation tools (flip and rotate), although its only special-effects filter is Invert.

Granted, Easy Color Paint isn't a top-of-the-line product, but you won't be seriously disappointed with it if you accept it for what it is: an extremely simple, no-frills color paint program.

Color Expert-ease

Despite the similarity in names, Expert Color Paint is in no way related to Easy Color Paint (it *is* kin to Paint It!, however). Although it's a bit less expensive, Expert Color Paint actually provides much more in terms of features and sophistication than MECC's product. In fact, it's one of the stars of this group of programs.

Expert Color Paint enhances the basic set of selection and painting tools by letting you maintain tool sets with unique settings for specific tools (see Figure 4). You can call up any tool set via a pop-up menu. Along with a gradient-fill tool, you'll find a magic-wand tool that lets you automatically select areas in an image by color. The program supports multiple undos and can publish System 7 editions.

As in Color MacCheese, anti-aliasing smoothes out the rough edges in objects and text and dithering simulates more colors than your monitor is able to display. Brightness and contrast controls let you fine-tune scanned images. The program provides some limited special-effects options (Blur, Sharpen, and Invert) and you can also stretch, rotate, slant, flip, and otherwise play around with perspective.

Expert Color Paint offers 32-bit-color capabilities. You can also create and save custom color palettes and pattern sets — a handy feature that enables you to build, for example, a color palette of earth tones or pastels that you can access with a mouse click. And speaking of mice, Expert Color Paint even has a Mouse Coordinates floating palette, which provides information on the mouse's position and the size of lines and shapes as you create them.

Originally developed by MicroFrontier — the company that was responsible for Enhance, an outstanding scanned-image editor — this program has an auspicious origin, and MicroFrontier's fine touch is evident in Expert Color Paint's easy interface and general overall quality. This is a very attractive application in all respects, including its modest price.

Don't Paint It Black

Paint It!, like Expert Color Paint, was originally developed by MicroFrontier (you can tell by the dopey Smiley Face fill pattern), so this release, under the Timeworks label, bears some similarities to that program in the interface and feature set. For more functionality, Timeworks also sells Color It!, which is essentially Paint It! on steroids and offers Photoshoplike capabilities for $299.95.

Paint It! has all the standard tools, most of which let you set control parameters — for instance, paintbrush opacity, airbrush flow rate, pencil size, and so on (see Figure 5). The dialog box in which you customize tool settings includes a scratch-pad area, where you can preview the results of your new settings without returning to your main document. The magic-wand and gradient tools give you powerful selection and painting capabilities. Unlike Expert Color Paint, this program does not support multiple tool sets, but Paint It! does offer anti-aliasing as well as a helpful virtual-memory scheme that enables you to work with files whose size is larger than what your RAM would normally allow.

The color and pattern palettes are almost identical to those in Expert Color Paint, except that both palettes are combined in a single, floating window. This arrangement makes for an uncluttered screen.

Paint It! includes several palettes to augment the default ones, and you can create custom palettes as well. The program also has the usual transformation tools (rotate, skew, and so on) and one special-effects option (Invert). There are no controls for brightness or contrast, however, which makes Paint It! the wrong tool for working with scanned images.

Paint It! is a fine product, but given that Expert Color Paint offers more for less money, we'd recommend passing on this one or spending more for its big brother, Color It!

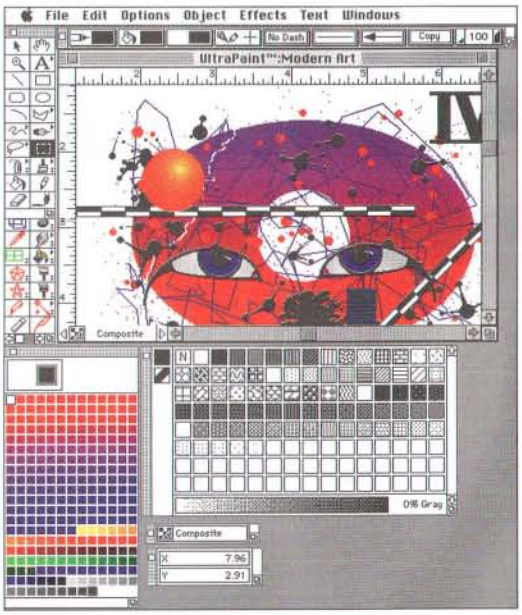
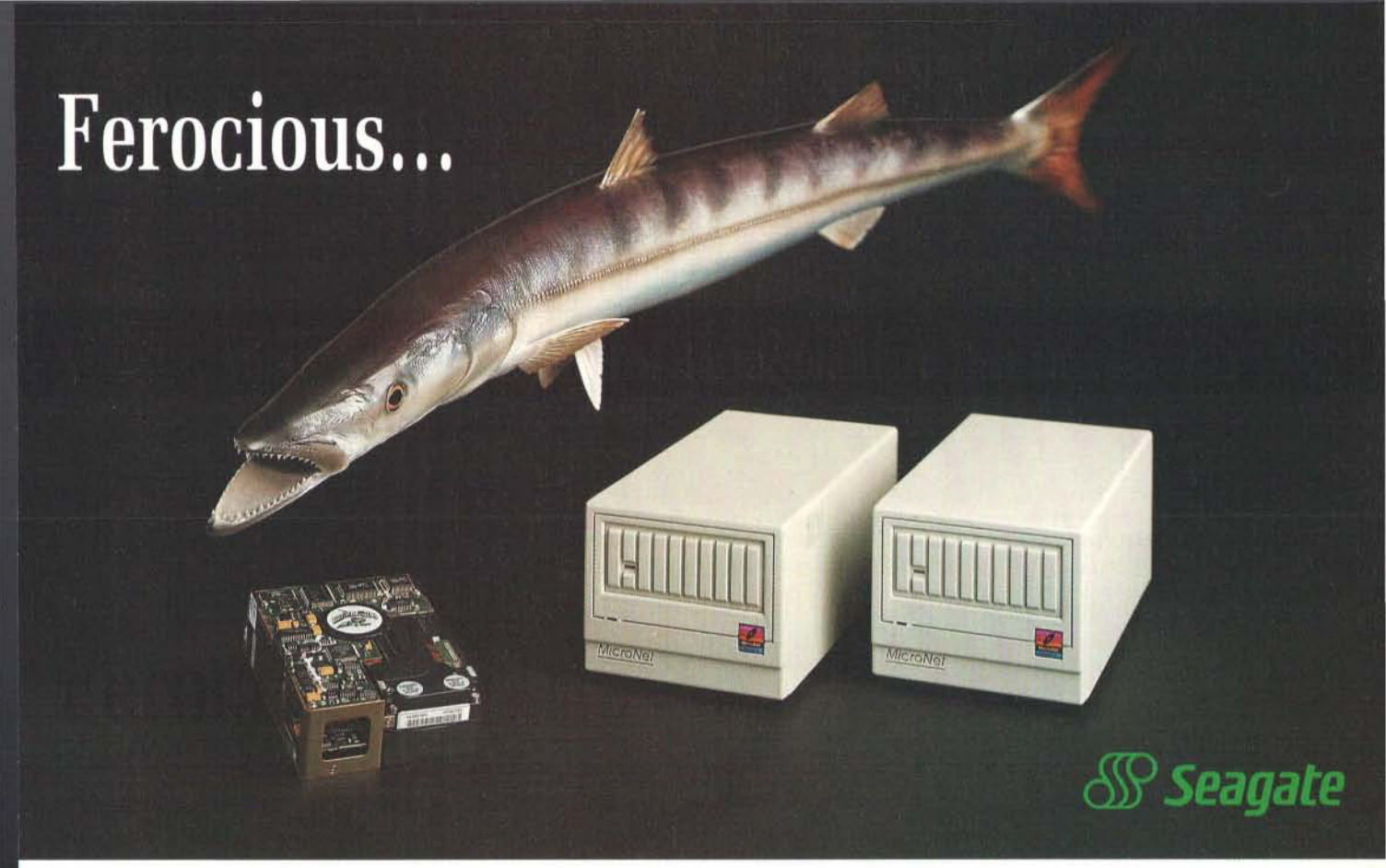


Figure 6: UltraPaint's tools include auto-tracing, layer controls, and masking options. It may be too complicated for some users, however.



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Ultracool Color

UltraPaint is by far the most powerful of the six programs. It provides painting and drawing tools, along with several advanced options that make it a winner by the sheer force of its features.

Unfortunately, Deneba has frozen the product, so the current version, 1.05, is the last version that will ever appear. What would have been UltraPaint 2.0 instead became artWORKS (see review, May '93, page 62).

In addition to all the regular selection and painting tools, UltraPaint includes several drawing tools (see Figure 6). It's the only program in this group that offers the added power of object-oriented drawing. Bézier curves with joining and splitting options are available.

You also get several unique drawing tools, such as a star, a 3-D cube, and a "multigon" (for radially symmetrical shapes). A grid tool makes it a snap to create tables or forms, and an auto-trace function lets you convert bit maps to draw objects.

If you're looking for simplicity and joie de vivre, choose Color MacCheese. It's a delight and seriously fun.

On the paint side, UltraPaint offers special-effects filters; transformation tools; control over brightness and contrast; smudge, charcoal, and chalk tools; layer controls; and masking options.

Its remarkable combination of features and power makes UltraPaint attractive. However, the complexity of the product also makes it relatively hard to master. Moreover, Deneba's decision to freeze the product in its current version puts the program's future viability in doubt.

The Bottom Line

If you're looking for simplicity and joie de vivre, choose Color MacCheese. It's a delight and seriously fun. If you need a more sophisticated product or need to work with scanned images in addition to painting, Expert Color Paint, with its great combination of features, low cost, and simplicity, should top your list.

Gregory Wasson is a contributing editor to *MacUser* and author of the *MacUser Guide to Shareware* (published by Ziff-Davis Press). He's also the primary sysop for the ZiffNet/Mac Download & Support Forum.

Table 1: Features of Budget Color Paint Programs

● = yes ○ = no	Color MacCheese 2.09 ★★★★	DeskPaint 3.5 ★★★★	Easy Color Paint 3.0 ★★★	Expert Color Paint 1.0.1 ★★★★	Paint It! 1.0 ★★★½	UltraPaint 1.05 ★★★½
List price	$99	$199*	$59.95	$49.95	$59.95	$79
32-bit color	●	○	○	●	●	○
Anti-aliasing	●	○	○	●	●	●
Custom palettes/fills	● (minimal)	●	● (minimal)	●	●	●
Minimum disk space	290K	400K	600K	800K	1 MB	1.5 MB
Drawing tools	○	○†	○	○	○	●
Export formats	MacPaint, PICT, TIFF, StartupScreen	MacPaint, PICT, TIFF	MacPaint, PICT, TIFF	MacPaint, PICT, TIFF	MacPaint, PICT, TIFF, StartupScreen, QuickTime PICT, GIF	MacPaint, PICT, TIFF, StartupScreen, MacDraw
Gradient fills	●	●	●	●	●	●
Layer control	○	○	○	○	○	●
Magic-wand tool	○	○	○	●	●	●
Masks	○	●	○	○	○	●
Publish and subscribe	○	○	○	● (publish)	● (publish)	○
RAM required	1.3 MB	2 MB	1 MB	2 MB	2 MB	2 MB
Special-effects filters	○	●	○§	●	○§	●
Transparency control	●	●	●	●	●	●
Works in black-and-white	●	●	●	●	●	●
Company	Delta Tao Software 760 Harvard Ave. Sunnyvale, CA 94087 408-730-9336	Zedcor 4500 E. Speedway Tucson, AZ 85712 602-881-8101	MECC 6160 Summit Dr. N. Minneapolis, MN 55430 612-569-1500	Expert Software P.O. Box 144506 Coral Gables, FL 33114 305-444-0800	Timeworks 625 Academy Dr. Northbrook, IL 60062 708-559-1300	Deneba Software 7400 S.W. 87th Ave. Miami, FL 33173 305-596-5644

*Suggested retail price; you can order the DeskPaint/DeskDraw bundle directly from the manufacturer for only $29.95 by calling 800-482-4567.

†DeskPaint comes with a separate drawing program.

§This program's only special-effects filter is Invert.

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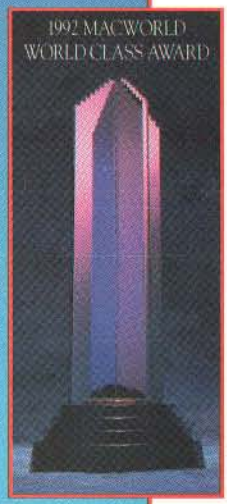

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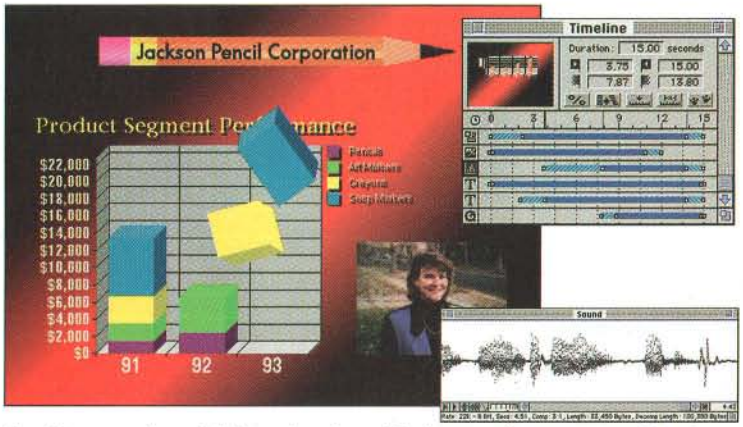

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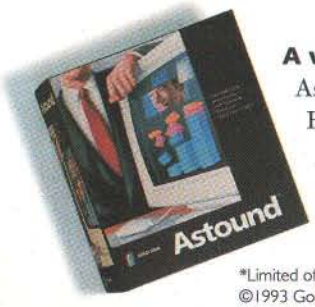

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Paint by Numbers

Use Photoshop's channel calculations to create 'algorithmic paintings.'

By Kai Krause

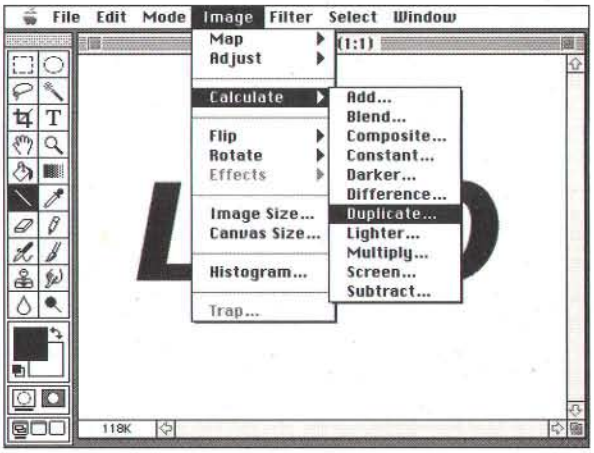
If you're anything like the typical Photoshop user, you've toyed around with various features to some degree. Then one fine day, you stumbled across those pesky channel-calculation modes, and chances are that you didn't get very far. I'm convinced that channel calculations may be the most powerful part of Photoshop, and in this article, I'll lead you slowly into the virgin territory I call algorithmic painting.

Algorithmic painting means that you can create original images, effects, and treatments by steering a process (an algorithm) as opposed to using brushes or other drawing tools that literally push pixels around on-screen. The idea is to isolate particular step-by-step procedures as repeatable tools: sequences that create shadows, highlights, halos, glows, embossed-relief effects, shaded depth-curvatures inside shapes, and fine lines around edges. Starting with any shape, font, or logo — be it drawn, scanned, or faxed — you can build highly complex compositions by combining all the step-by-step procedures and end up with multilevel images that even the most accomplished airbrush maniacs would find difficult to create.

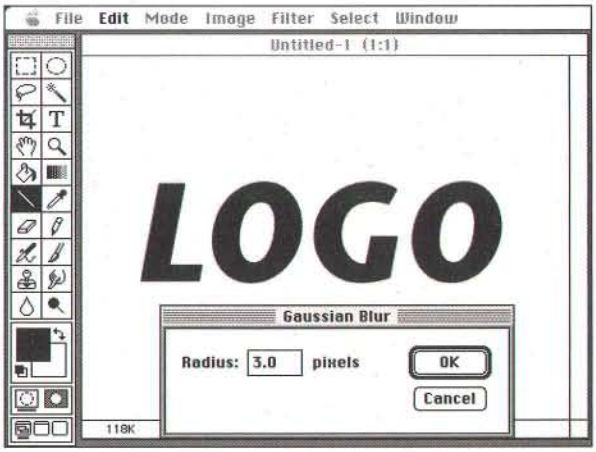
Rather than explaining channel operations — I call them chops — through abstract math, though, I'll describe them through specific applications and examples. The Photoshop manual and most books ignore the issue entirely or simply provide self-referential descriptions of the formulas: "The Multiply command multiplies the brightness value" . . . yeah, right!

We'll start with a plain piece of text and explore the possibilities. You can algorithmically paint in color, but it's easier to start out in gray scale, so that's where we'll begin. I strongly recommend that you take this magazine over to your Mac and follow along, step by step. Things make much more sense when you're doing them! The following steps are the same for versions 2.0 and 2.5 of Photoshop, although the dialog boxes may look a little different. A reminder: Using chops means that you'll be combining windows to make others, and you'll quickly fill your screen with windows, each bearing the name Untitled. To help you keep your sanity, name each window as you go along.

1a

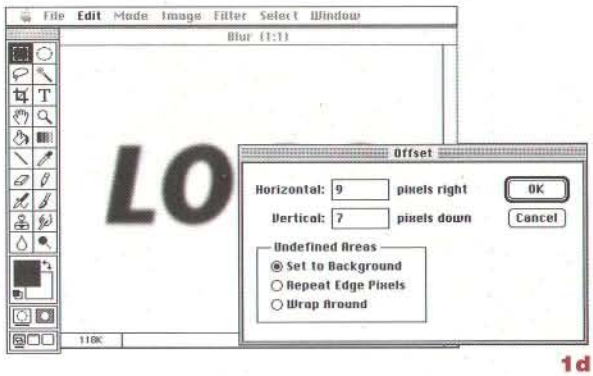


1b

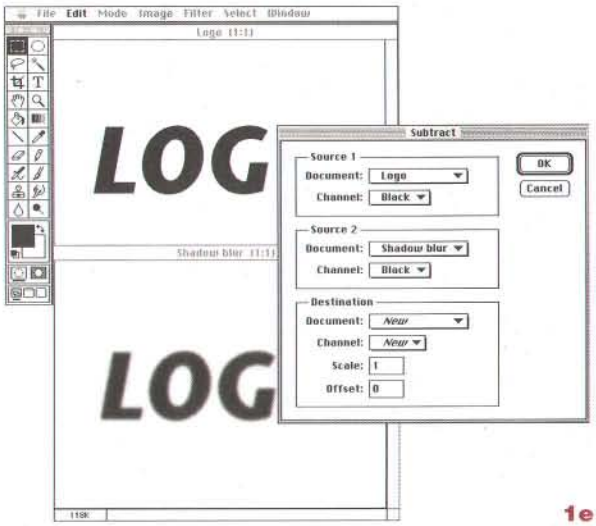


1c

Algorithmic painting means you can create images and effects by steering a process as opposed to using brushes to push pixels around on-screen.



1d



1e

1f

Soft Drop Shadows

You can certainly draw shadows, using the airbrush tool, but this requires skill and patience and your brush size is limited. For a large image, you may have to scroll or zoom and getting a consistent effect across the entire picture can be difficult. The chops method, on the other hand, is a simple procedure and is resolution- and size-independent. Better yet, it applies to the whole image simultaneously, regardless of complexity, so you can give a shadow effect to 1,000 complicated shapes as easily as you can to a simple circle.

Let's get started:

1. Make a file called Logo. Create a 400-x-300-pixel gray-scale image with anti-aliased text (see Figure 1). Make sure your foreground color is black and the background color is white (Photoshop 2.5 has a nifty little button that lets you instantly switch to this configuration). Make a copy of the file by choosing Duplicate, under Calculate, on the Image menu.

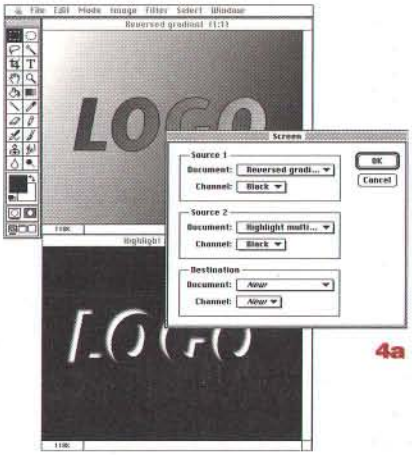
2. Blur the copy. Select Blur, on the Filter menu, and in the Gaussian Blur dialog box, set Radius to 3 pixels or more. Save this file as Blur.

3. Move the blurred image. You can drag the image away, but using Offset (under Other, on the Filter menu) is more precise and you can turn the process into a macro. In the Offset dialog box, set Horizontal to 9 pixels right and Vertical to 7 pixels down. When you're using the Offset filter here and in later steps, check Set to Background under Undefined Areas. Save this file as Shadow Blur.

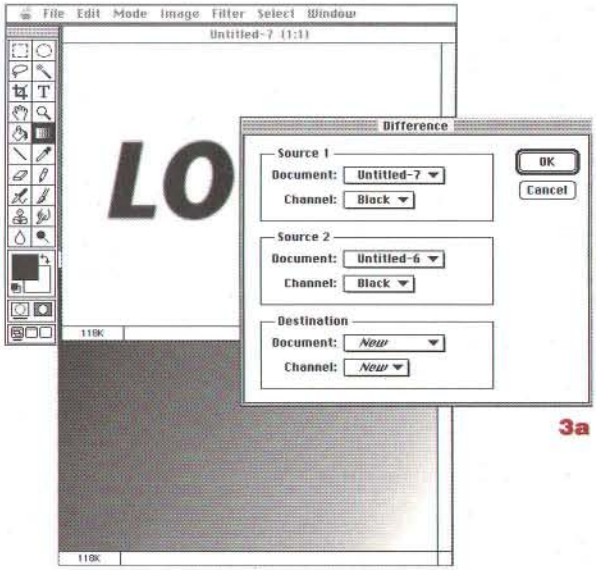
4. Subtract via chops. Now we come to the crux of it: Choose Subtract, under Calculate, on the Image menu. The Subtract dialog box contains three elements — Source 1, Source 2, and Destination. Leave Destination's settings at the defaults, with Document and Channel set at New and with Scale and Offset set at 1 and 0, respectively.

In many of the chops modes, the order of the Source 1 and Source 2 files is interchangeable, but with Subtract, it's important that the original shape (Logo) be in the top pop-up menu, as Source 1, with Shadow Blur as Source 2. Think of it this way: Whatever is black in the Source 1 image will be cut out of the Source 2 image; whatever is white will not affect it. Above all, whatever is gray will fall halfway in between, with 256 steps blending these extremes — this is a key to understanding chops.

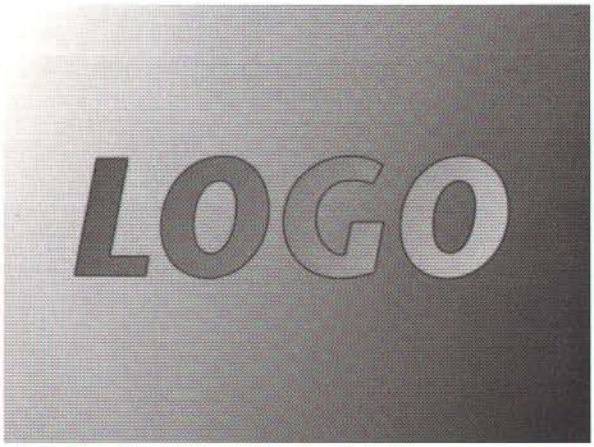
2



4a



3a



3b

5. Invert the image. Use Map, on the Image menu, or press Command-I. The diffused and displaced shadow information is now isolated against a white background, and you have a lovely shadow effect. Save this file as Shadow Multiplier (you'll see why later).

Glowing Highlights

Creating highlights is almost identical to creating drop shadows.

Duplicate the blurred, displaced copy (the file we called Shadow Blur in step 3 of the drop-shadow procedure), and in the Offset dialog box, enter values that will move the image to the other side of the shadow. For instance, if the shadow offset is 9 pixels right and 7 pixels down, using negative numbers will move it left and up, respectively — try –18 pixels horizontal and –14 pixels vertical. Save this file as Highlight Blur.

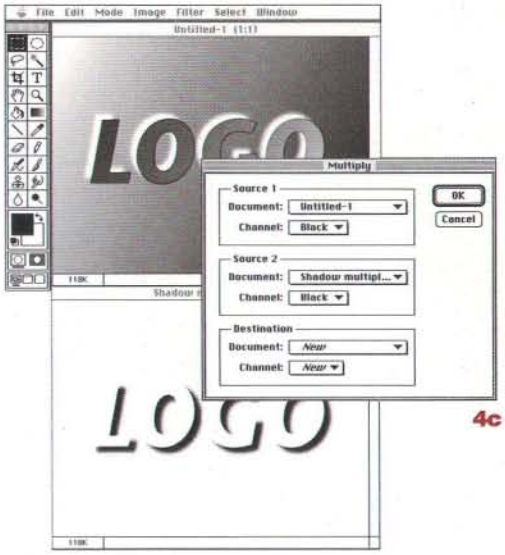
Now do the subtract operation. Make the original Logo file Source 1 and the blurred, offset copy — Highlight Blur — Source 2. This time skip the inversion (step 5). Now your logo has glowing highlights (see Figure 2). Save this file as Highlight Multiplier.

Putting It All Together

As a simple exercise to see how these things can be used together, let's try this: With yet another duplicate copy of Logo, create a diagonal blend, using the gradient tool. To make it look really good, we'll add one more step before we use chops. Make another duplicate of the Logo file. Apply a Gaussian blur of 1 to 2 pixels (you can use your previously saved Blur file, but a 3-pixel blur may be too much — see what you think). You should have one window containing a slightly blurred logo and another containing a gradient fill (see Figure 3).

Now we'll use a chops mode called Difference (also under Calculate, on the Image menu). Make the slightly blurred logo your Source 1 document and the gradient fill your Source 2 document. Although the name Difference seems self-explanatory (it's the difference between two images, obviously), the effect of the Difference calculation is hard to visualize. One way to think of it is, If one source is gray-scale, the black portions in Source 1 will be inverted in Source 2 whereas the white portions will be unaffected. In this example, the original

Re-creating this composite image sounds more complicated than it is, like describing how to sneeze, and would be daunting with traditional Photoshop tools.



4c

shape inverts the gradient, and we get a logo with an internal gradient that's the reverse of the background gradient. The text has smooth, anti-aliased edges. Neat, huh? But we're not done yet. Save this file as Reversed Gradient.

Now we add the highlights: Choose Screen (under Calculate, on the Image menu). In the Screen dialog box, Reversed Gradient should already be showing as the Source 1 document; if not, make it so (see Figure 4). Now select Highlight Multiplier, on the Source 2 pop-up menu. The result will be yet another window.

Then add the shadows: Choose Multiply (again, under Calculate, on the Image menu). In the Multiply dialog box, keep the current composite from the preceding step as Source 1 and select Shadow Multiplier, created earlier, in the pop-up menu as Source 2.

The result? We now have the logo in the center with a reversed gradient, the highlights above it and the shadows below it, all over a gradient background (see Figure 5). You can call it some permutation of Shadow Highlight Gradient or Final Logo — whatever you like.

Slowly things are getting more and more complex. Our results show promise and also illustrate the unique nature of algorithmic painting.

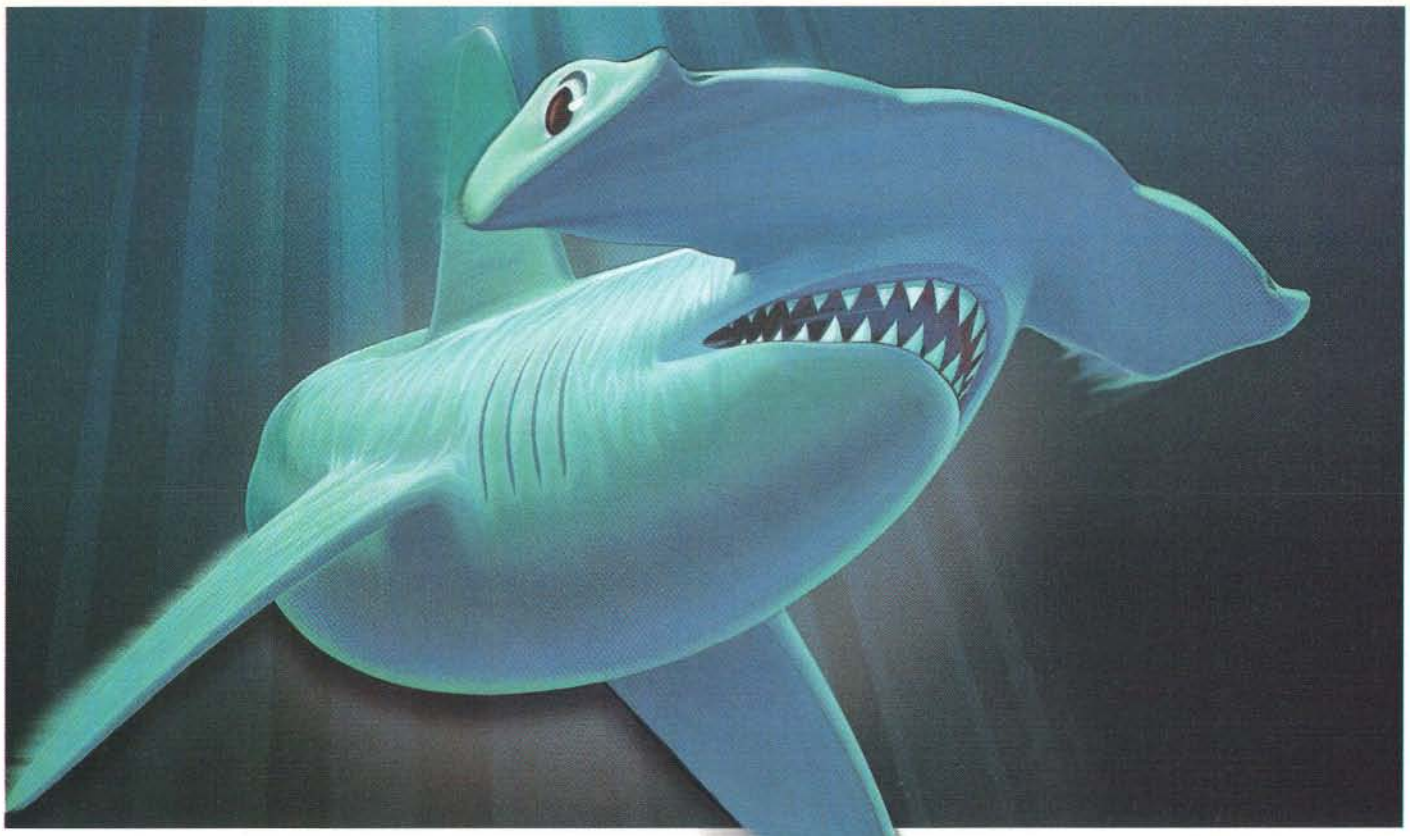
Re-creating this first composite image (and its description makes it sound much more complicated than it really is, kind of like describing how to sneeze, muscle by muscle) would be rather daunting with traditional Photoshop tools. (Also, consider that you can capture all these steps in a macro and then play them back on any clean black shape. In fact, you can even re-create the sequence at any resolution. Take care to edit the offsets, of course. A horizontal offset of 9 pixels is more pronounced in a 400-x-300-pixel image than in a 4,000-x-3,000-pixel image.)

This is only the beginning. Next time, we'll explore embossing and other algorithmic-painting effects — you may want to save the files you've created, for the next installment. Remember: It takes practice to get your chops down!

Kai Krause conducts a Photoshop forum on America Online. He is also vice president of research and development of HSC Software.

4b

5



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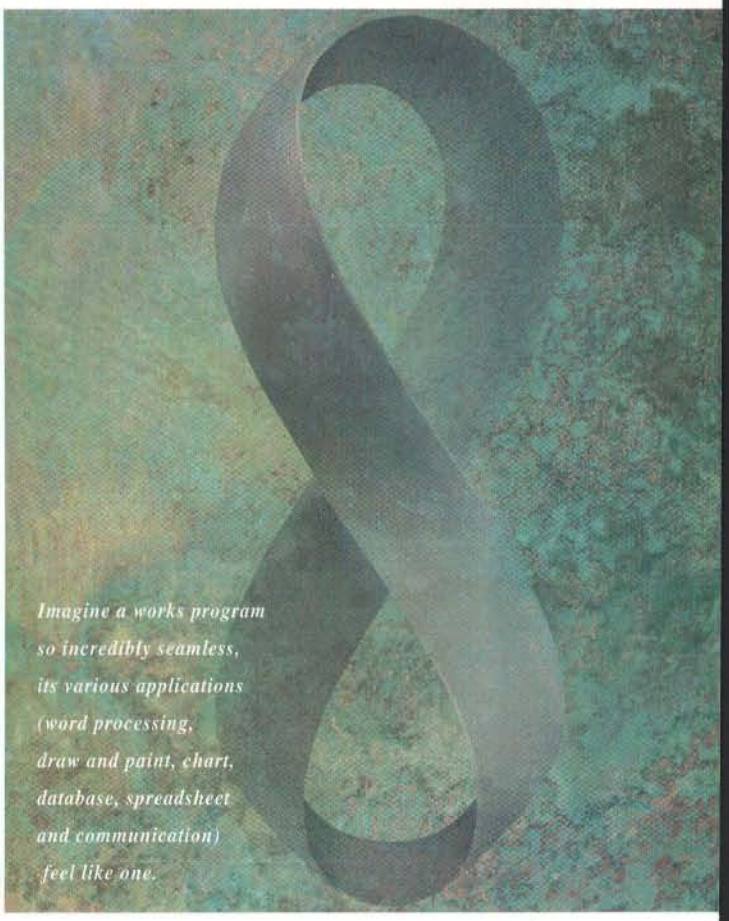

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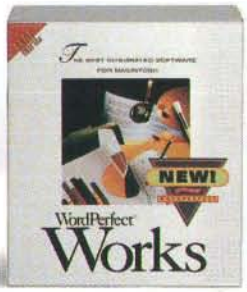

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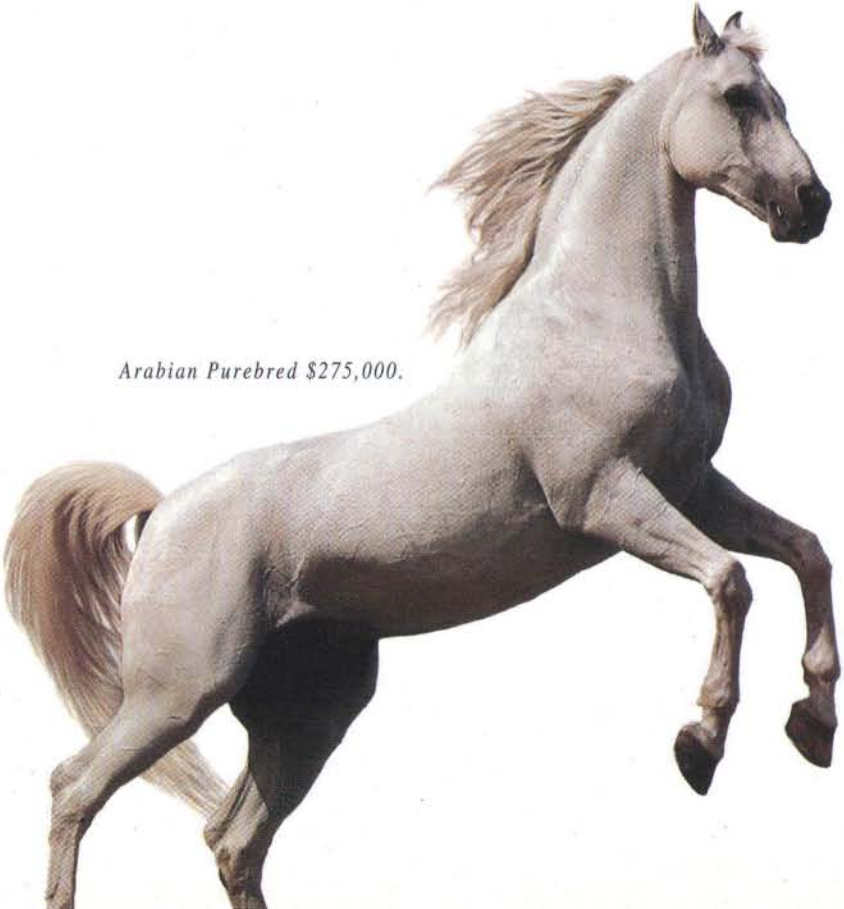

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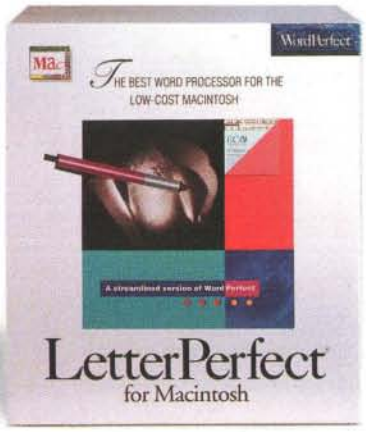

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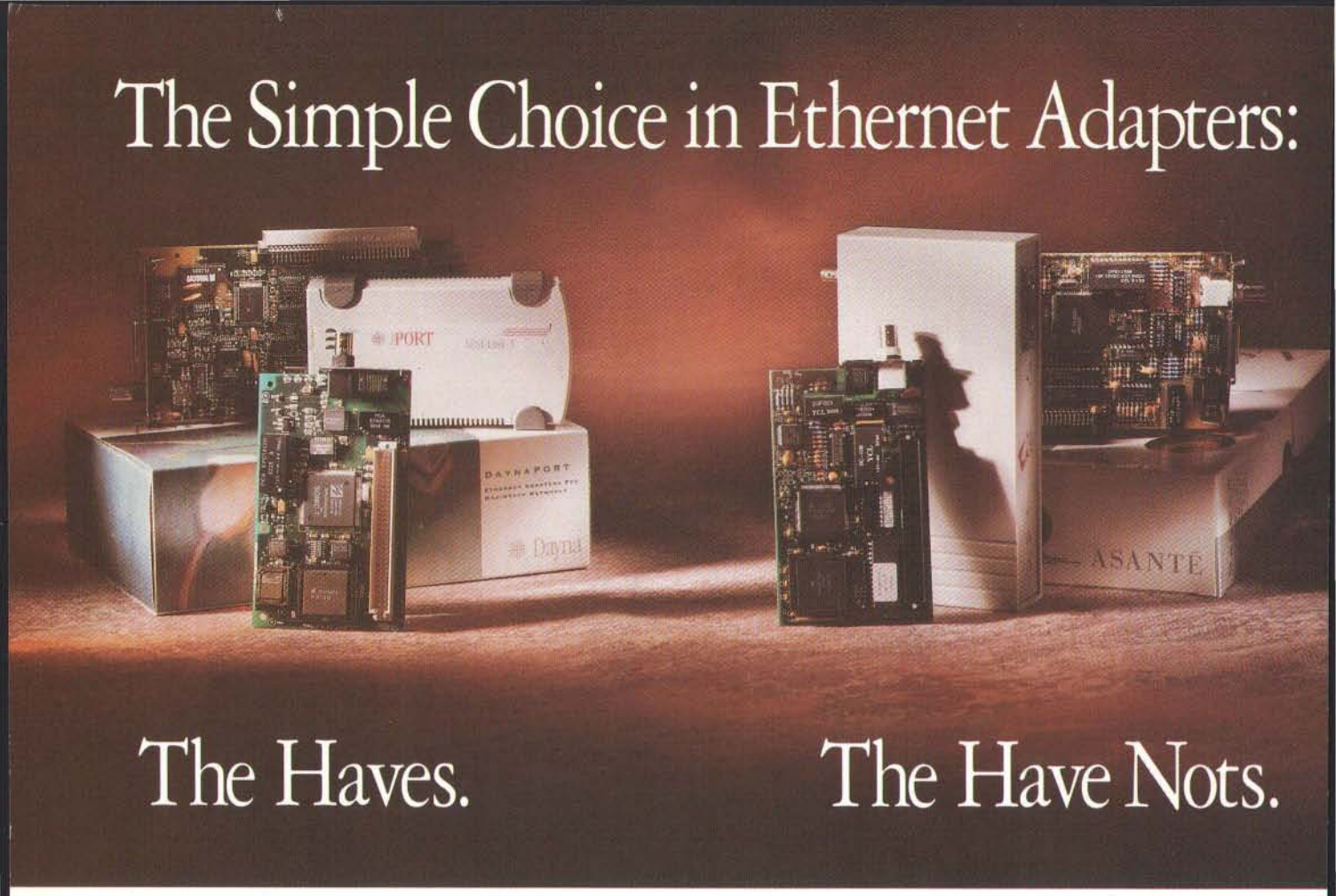

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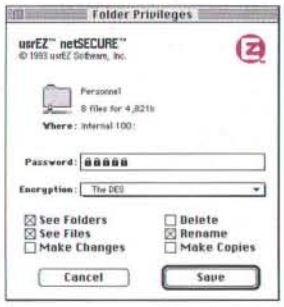

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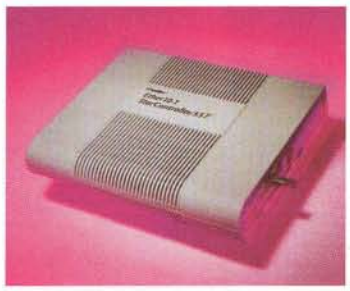

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By Stephan Somogyi

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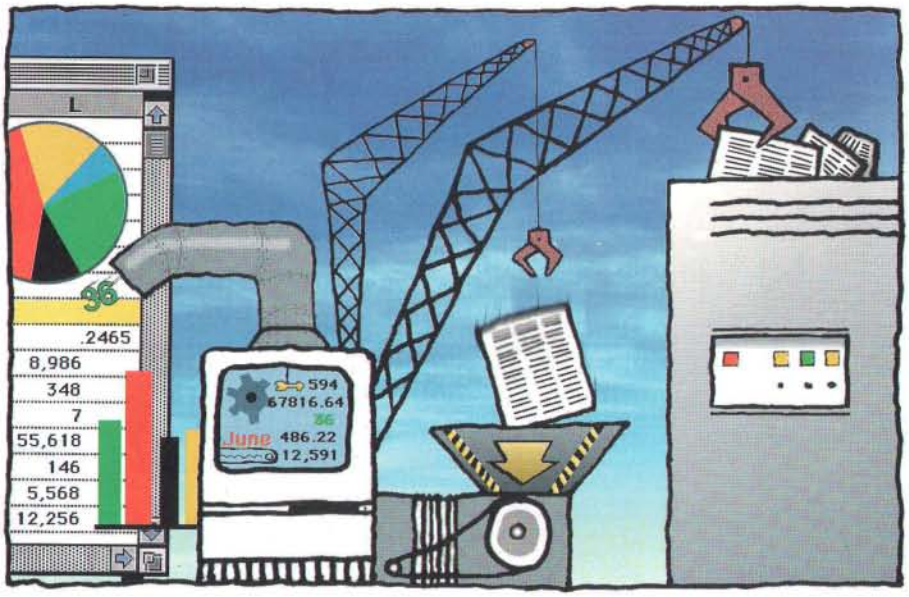
CIRCLE 192 ON READER SERVICE CARD.

MIS-ing in Action



If the crucial business information you need is on the MIS department's mainframe, it's time to bring it to your Mac and get cracking with some real *data-analysis tools.*

By David Beaver

You know it's out there. Somewhere in the staggering mass of data stored on a central computer in your company's MIS (management information system) department lurks what you need: the important numbers, statistics, and records that — if you could only get your hands on them — would give you a better understanding of your business and let you make smarter decisions. But the data's in a big mainframe database, and you're working on a Mac, without the tools you need in order to grab the data and turn it from raw numbers into meaningful *information.*

Fortunately, tools to do this do exist, even if you're not using them yet. Thanks to the development of client/server database technology (see "The Client/Server Revolution," November '91, page 185) and intermediate Mac-to-mainframe software known as *middleware,* Mac (and PC) users can reach directly into central corporate databases and pull any subset of data across the network — without having to request data from the MIS department.

And to help users turn that data into useful information, a whole new class of software products has emerged for the Mac. These products, which are targeted at users who want to analyze host data, fit into three general categories:

• Spreadsheet stuffers, which help you query SQL (Structured Query Language) databases and bring data into Mac applications such as spreadsheet programs.

• What-is tools, which provide you with flexible options for viewing data from host computers and other sources and which help you find answers to specific questions ("What is the product that costs us the least to manufacture?").

• Map-based tools, which help you view data from host computers and other sources in a geographical context.

Once the back-end connections for these applications are in place (see the "Making It Work" sidebar), you'll be well positioned to get the data you need when you need it and to turn it into the kind of information you can really use.

Spreadsheet Stuffers

The first place to start with data-analysis software is, of course, with a spreadsheet program. The various programs available for the Mac each provide a familiar and simple user interface for dealing with complex combinations of data and calculations, and they're the tools of choice for most financial and data analysts.

The real drudge work of analyzing data with a spreadsheet program is typing in the numbers you want to analyze; many of the first client/server software products were designed to solve this problem. Known as query tools, data dippers, and spreadsheet stuffers, these tools let you search a host computer's databases and quickly bring the resulting data into a spreadsheet program (or other desktop application). Empowered with one of these tools, you can perform queries in seconds, freeing up time you can then use for data analysis.

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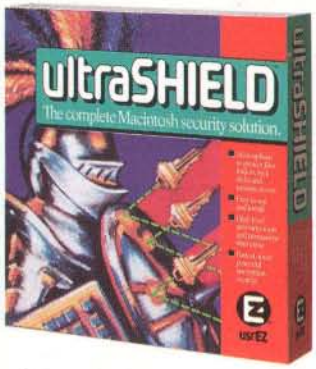

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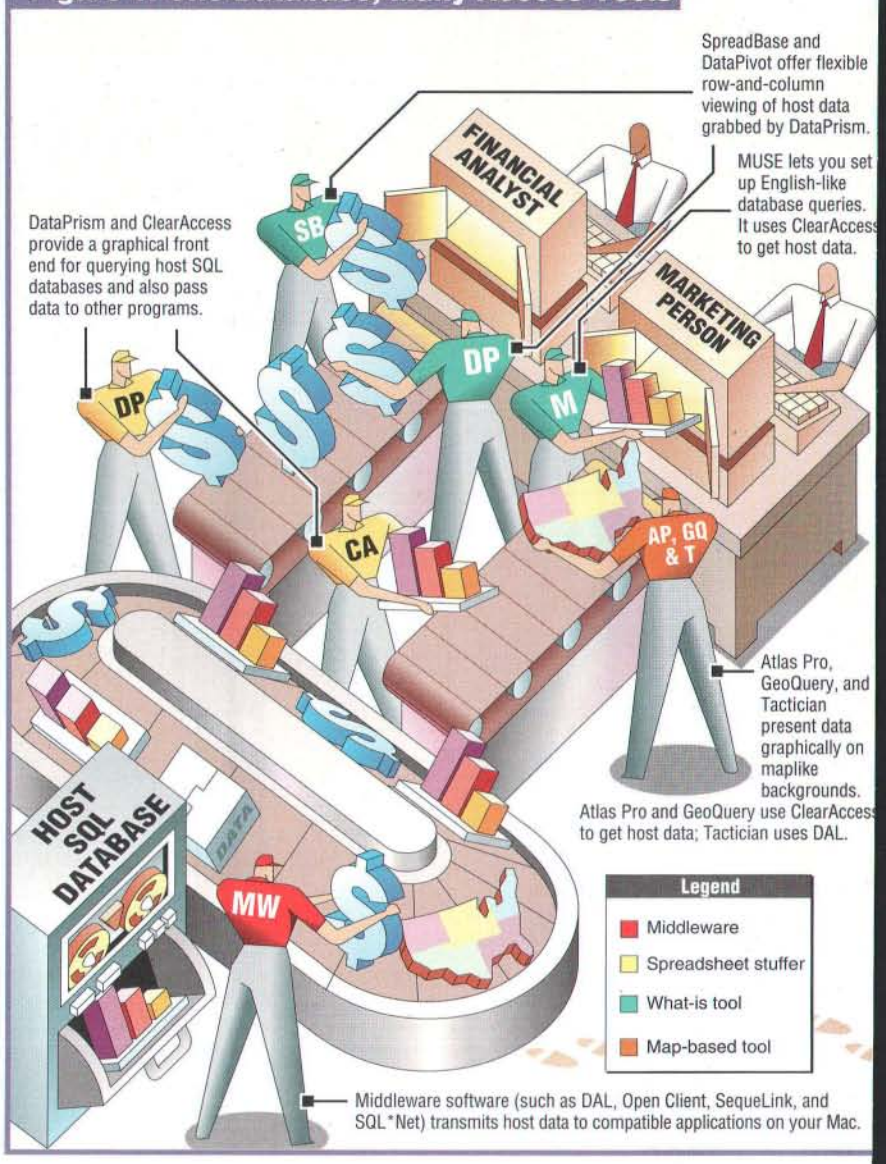
Figure 1: One Database, Many Access Tools



Three leading products — ClearAccess, from ClearAccess Corp.; DataPrism, from Brio Technology; and GQL (Graphical Query Language), from Andyne Computing — fill this niche for the Macintosh, each offering a different kind of trade-off between power and ease of use.

ClearAccess: SQL Made Easy. ClearAccess gives users all the power of querying a SQL database directly without the hassle of remembering the exact syntax of SQL commands. It's a DA that lets you build database commands by clicking on items in lists of database elements. You might, for example, opt to see total sales volume by region for the last 12 months. ClearAccess sends the resulting command to the host and brings the data into any open application (such as a spreadsheet program or a word processor) or into files on your Mac's hard disk.

ClearAccess is a good tool for users familiar with SQL; although it has a point-and-click interface, users who don't know anything about SQL may become confused when setting up complex queries, such as those that join data from multiple databases.

Figure 1: Many new software tools are available that give Mac users flexible ways to access and manipulate data from mainframe computers. *Spreadsheet stuffers,* which connect to host SQL databases through middleware from Apple or database-software vendors, give database-savvy users a comparatively easy way to query mainframe databases (or build preprogrammed queries for others to run) and import data into spreadsheet programs or other applications for further analysis. *What-is tools,* which generally connect to host databases through spreadsheet stuffers, give analysts flexible ways to view data and find answers to specific what-is questions. *Map-based tools,* which connect to middleware either directly or through a spreadsheet stuffer, give users a tool for displaying location-based data — for example, different data ranges can be represented by shades of various colors on a map.

GQL is well suited to setting up prewritten queries that get host data at the click of a button.

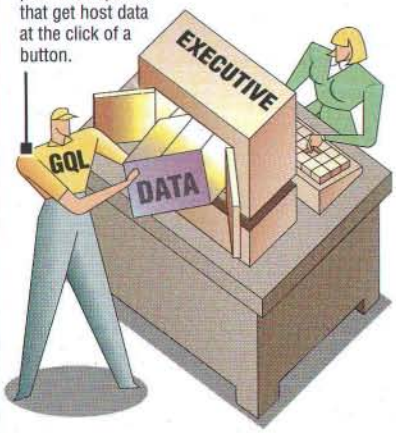


ILLUSTRATION: JOHN CORBITT

DataPrism: A Graphical Query Builder. For those with less inclination to be "power users," DataPrism provides capabilities similar to those of ClearAccess but with more user-interface features to insulate users from the underlying details. DataPrism lets you see a graphical view of your data files with database *joins* (links between databases) automatically recognized. Alternatively, you can choose a view in which the first few rows of each table are displayed in row-and-column form (a useful way to understand the data you're dealing with). Like ClearAccess, DataPrism lets you import the data you want into your Mac applications. It also includes a graphing module.

GQL: Press a Button, Run a Query. GQL provides an easy way for users to repeatedly query a host database, such as requesting the latest sales figures every morning, without having to know the details of the data structures. With the GQL Designer application, a programmer or a database administrator can use a MacDraw-like interface to set up a document with a graphical representation of the database, preprogrammed query buttons, and so on. When you use this document with the separate GQL user application, you can run queries at the click of a button, although you can't modify the query document at all.

With a spreadsheet stuffer, you can run a prewritten query by double-clicking on a document — and power users can perform ad hoc queries.

Selecting a Spreadsheet Stuffer. Although these products are intended for different classes of users, they have many capabilities in common. For example, users of any of the three can run a prewritten query by double-clicking on a document, although GQL is the best suited for this use. Similarly, power users can perform ad hoc queries with each, although ClearAccess and DataPrism are better suited for this purpose. In addition, all three support the same standard connectivity software — DAL (Apple's Data Access Language), Open Client, SequeLink, and SQL*Net, among others — and have Windows versions either shipping or in development. We recommend that MIS professionals looking for a query tool learn how to use all three of these tools so they can make an informed choice when selecting a tool to meet their users' needs.

What-Is Tools

Spreadsheet stuffers are great if you want to get data into a spreadsheet in order to answer what-if questions — for example, you can quickly calculate and

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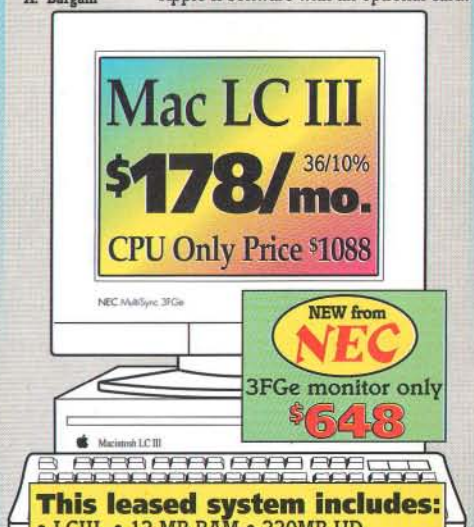

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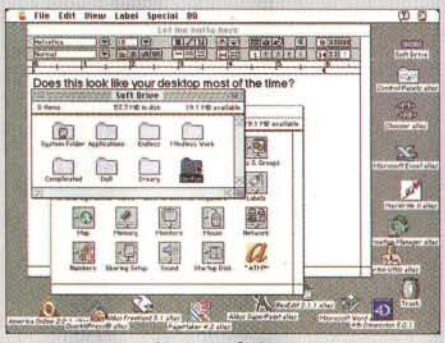

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recalculate sophisticated models of your business to answer the question "What happens if our expenses increase by 10 percent?" However, corporate data tends to be stored in detailed low-level records — for example, one record for each sale of an item to a customer. If your company generates thousands or millions of sales records per month, an analyst using a spreadsheet program would have to look through all this data visually in search of useful information — not an enjoyable task!

Many corporate users want to move beyond what-if analysis and into *what-is analysis.* Essentially, this involves separating information from large amounts of historical data to get answers to specific what-is questions such as these: "What is our best-selling product?" "What is our median sales region?" "What was the effect of our last marketing promotion?"

A new crop of software tools has recently sprung up to meet this need. These tools present a familiar, spreadsheetlike interface, but they store the underlying data in a separate database, rather than in the spreadsheet itself. Because they disconnect the presentation of the data from the data itself, they can be extremely flexible in the ways they let you view data, quickly turning it upside down and inside out while you look for interesting patterns. You can effortlessly unearth meaningful subtotals or see different groupings on the fly — for example, in a matter of seconds, you can change from a view of your products' monthly sales volume subtotaled by region to one of regional totals by sales rep, just by clicking on and dragging icons.

The grandparent of these products is Lotus Improv, which offered the first interface of this type for NeXT computers and is now available for Windows. Three Mac products are currently competing in this category: DataPivot, from Brio Technology; SpreadBase, from Objective Software; and MUSE, from Occam Research. Each offers its own approach, as will an upcoming product from Andyne (see the "On the Horizon" sidebar).

DataPivot: Flip Rows and Columns. DataPivot provides basic "pivoting" features — that is, the ability to flip rows and columns in a table — for any Mac data, be it from a spreadsheet or from a host database. You can view the data, imported in delimited text format, in any row-and-column format you choose, including the format statisticians call *cross-tabulation.* To work with host data in DataPivot, you need to use DataPrism as the data-grabbing tool; an option in DataPivot allows you to get data from DataPrism via a special set of database-related Apple events, developed by Brio.

SpreadBase: Flip and Forecast. SpreadBase offers the same flexible row-and-column viewing as DataPivot does, but it has a larger set of features. SpreadBase includes its own database environment, into which you can import data

Making It Work

"Well, of course, I'd love to fiddle with data from the company's mainframe on my Mac," you may be saying. "But how do I know that these data-analysis products will work with the host database at my company? And how much time and money will it take to get one of these products set up so it's actually talking to the host?"

Basically, you need two types of connection between the host and your Mac: a physical network connection (see "Gateways to Big Blue," February '93, page 235) and also *middleware* — software on both your Mac and the host that lets them "speak" the same language.

We covered middleware a few years ago (see "The Invisible Bridge to Mainframe Data," January '91, page 138), and not much has changed since then. If you're connecting to an ORACLE database, Oracle's SQL*Net software can provide the connection; if you're connecting to a SYBASE database, you can use Sybase's dbLibrary products; and if you're using these or many other databases, such as INGRES, INFORMIX, DEC rbd, or IBM DB/2, you can use Apple's DAL (Data Access Language). In each case, you need to install the software on your Mac and on your host and make sure your Mac can "see" the host database across the network.

The key to making the connection is the industry-standard database language SQL (Structured Query Language). All the middleware products we've mentioned use SQL, and each of the query tools generates commands in SQL. If your host data is *not* stored in a

records from a host computer or other source. It also has many common spreadsheet-program features (formulas, a macro language, and so on) that are useful if you need to combine what-is analysis with more-conventional data modeling and forecasting. Like DataPivot, SpreadBase relies on DataPrism for grabbing host data (in this case, via SpreadBase's macro language and Brio's set of Apple events).

MUSE: Ask and Be Answered. For those whose data is coming primarily from a structured database on a host computer, MUSE offers sophisticated features for manipulating this data in a local structure that mirrors the host's. Most significantly, MUSE includes a *natural-language* query facility, which lets you query the database by typing free-form, English-like questions rather than SQL commands — for example, "What was our best-selling product last month?" instead of "SELECT MAX (VOLUME) FROM ORDERS WHERE ORDERDATE > JULY 1, 1993." MUSE does not connect directly to host SQL databases but can run queries created with ClearAccess or any other query tool that supports Apple's DAM (Data Access Manager).

The What-Is Learning Curve. Each of these products does require some learning time; although they look like spreadsheet programs, they are really quite different, requiring more up-front attention to the creation of data models. And each tool, as noted, requires either SQL database, you'll have to find some other means, such as terminal emulation, to get host data to your Mac.

When looking at middleware, be prepared for surprisingly high costs and a relatively complex installation process. As a rule of thumb, you should plan to spend $300 to $500 per user for the Mac side of the software and as much as $1,000 per user to install middleware on the host computer (the smaller-scale your host computer, the lower this cost tends to be). And the installation process requires a good understanding of your host operating system and your company's network configuration and protocols. If you're installing middleware on a minicomputer or mainframe, plan on 20 to 40 hours of your system manager's time to work out the kinks.

Of course, you may not need a direct connection to a host database to get the data-access capabilities you want. Versions of the leading SQL database products are available for low-end hardware such as UNIX workstations and even desktop PCs and Macs. You may find it cost-effective to set up a separate SQL database server on one of these platforms to support users who need to query corporate data; you can then write custom programs to move data nightly or weekly from the host computer into this separate database. Although users will be working on a copy of the actual data, it's still the same data and complex queries run on this database won't slow down users of the central host. Appropriately enough, Apple's new Workgroup Server products are targeted at exactly this type of use.

On the Horizon

As more Mac users discover the usefulness of spreadsheet stuffers and what-is tools, more vendors are jumping into this emerging market with new products.

At press time, a query-tool vendor from the Windows world announced it was bringing its BusinessObjects product to the Mac. BusinessObjects, expected to ship this summer, seems to be conceptually similar to GQL: Database administrators can use the Manager application to create graphical query documents for users, who can then run the queries without dealing with the underlying SQL queries. BusinessObjects will support Oracle's SQL*Net and Sybase's Open Client middleware at release; support for DAL is in the works.

Meanwhile, the company that makes GQL isn't resting on its laurels. Andyne is developing a tool, called PaBLO, for the what-is category. Expected to ship late in 1993, PaBLO will combine data-pivoting with strong layout and printing features. Once you've defined the underlying structure of your data (in a databaselike structure called a HyperCube), PaBLO will allow you to combine flexible row-and-column areas with text, graphics, charts, and other elements on a layout page. PaBLO is expected to support direct connection to host databases, using the same middleware options as GQL does.

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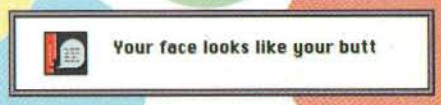

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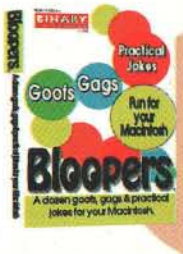

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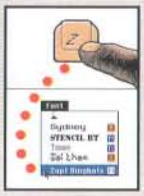

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DataPrism or ClearAccess to get data from the host, so you'll have to learn something about these tools as well. But don't forget that it took you a long time to become a spreadsheet-program power user; if you invest some time in one of these tools, it can make a real difference in the way you work with data.

Map-Based Tools

If you deal with regional or location information — for example, if your data can be grouped by country or state or by areas on a floor chart or even parts of the body — you may find that a map-based query tool provides the easiest-to-understand view of your data. These tools, which include Atlas Pro (Strategic Mapping), GeoQuery (GeoQuery Corp.), and Tactician (Tactics International), let you create backgrounds that contain maps (those included with the product or available as add-ons) or import drawings in AutoCAD format and link data to regions within particular bounded areas. Once these links have been set up, you can use such effects as color, shading, and dots to represent data values in immediately graspable ways. You can also display underlying data values — for example, you can click on a state to see sales and product activity for that state.

Like what-is tools, these products separate the presentation of the data from the data itself, and they too can work with data from a host computer (Tactician uses DAL to make the connection, whereas Atlas Pro and GeoQuery use ClearAccess) or from other Mac files. They don't really compete with the what-is tools; rather, they serve as graphical query tools, putting a simple interface on what can be complex queries of a host database.

Direction from the Host

Finding the information you need from your corporate mainframe doesn't have to be like finding a needle in a haystack. With a Mac-based spreadsheet stuffer, what-is tool, or map-based tool linked to your host database, you can greatly reduce the effort you've been putting into finding or massaging data. Plus, you can increase your ability to explore the data for meaning — that is, to turn it into that much-touted hot commodity of the '90s known as *information*.

David Beaver is president of The Automation Group, a leading database-management consulting firm in San Francisco.

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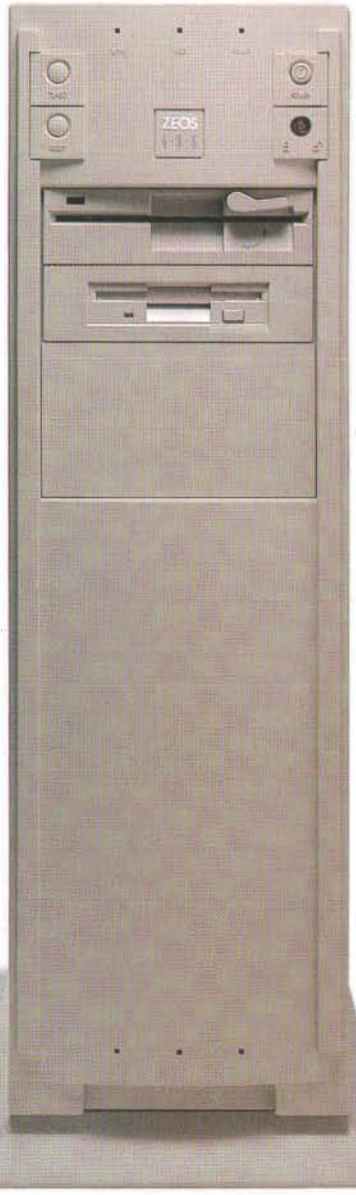

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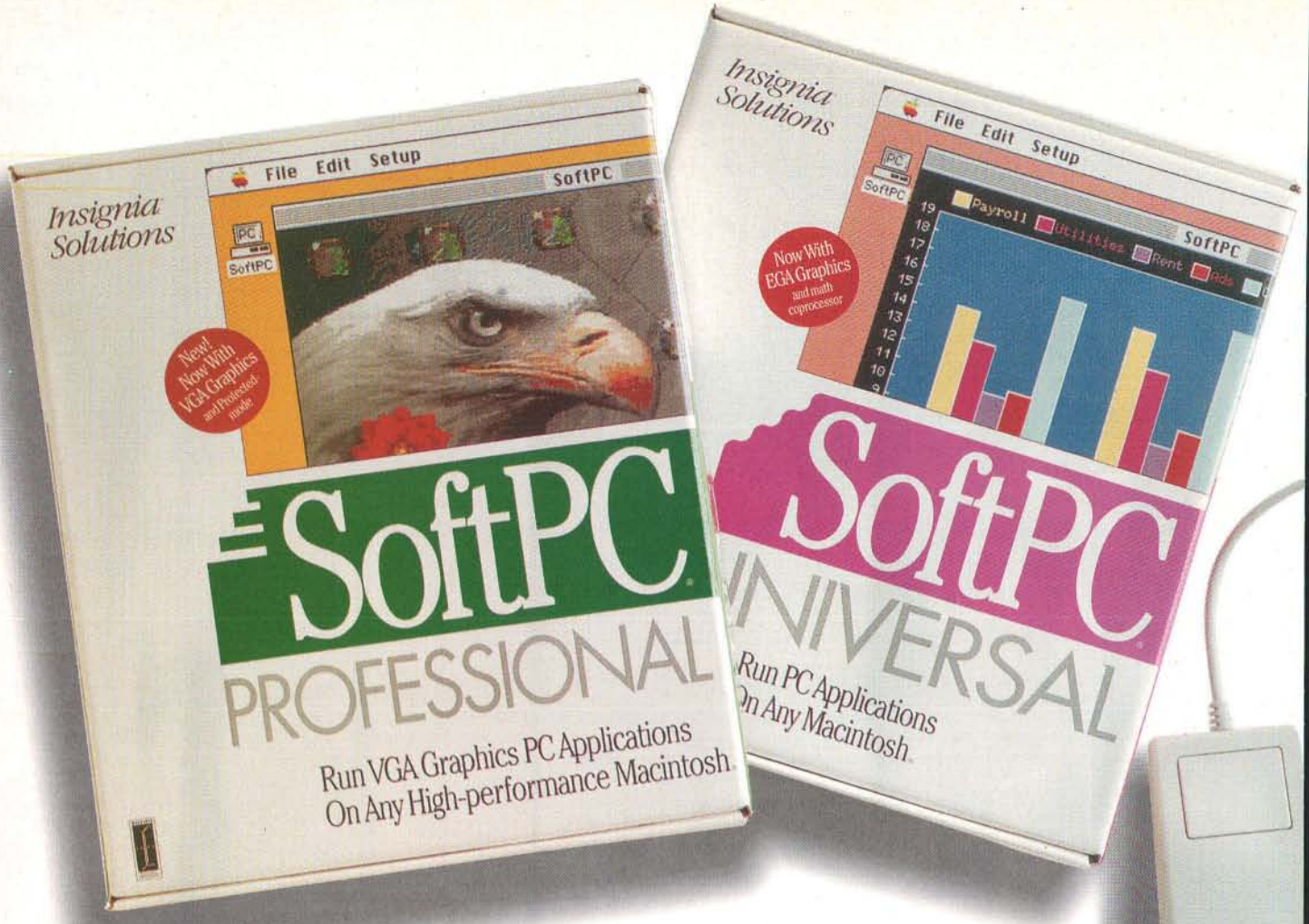

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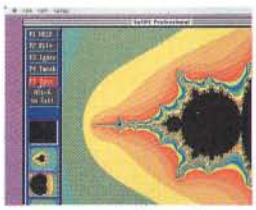

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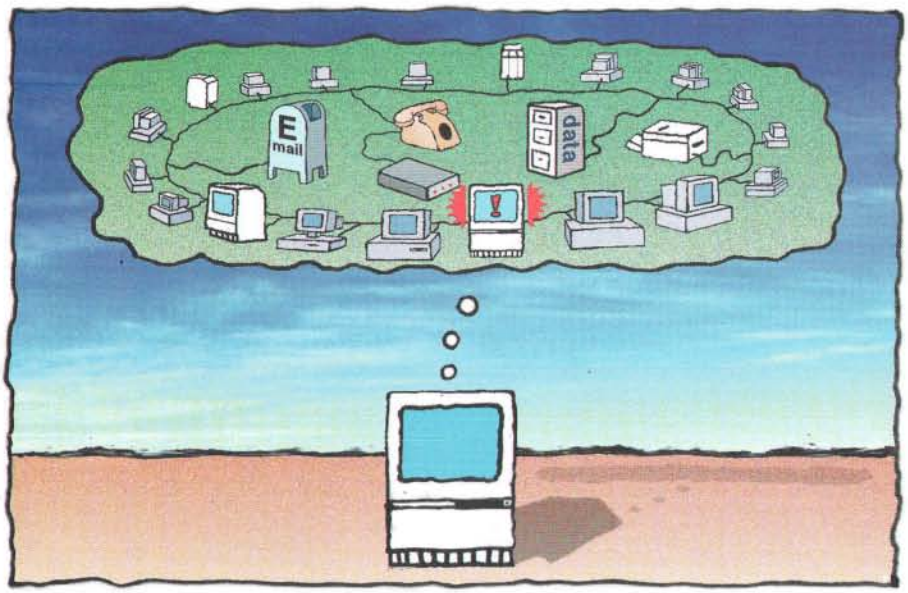
Real NetWare for Macs



Will Macs and PCs ever be truly equal partners on a network? Novell may have the key.

By John Rizzo

Question: What do Santa Claus, honest politicians, and cross-platform networks have in common? Answer: None of them exists (sorry, Virginia). You may think you've seen them, but what you've *really* seen are close approximations of the real thing. Not even Novell NetWare, the most popular and full-featured local-area-network application, has put Macs and PCs on the same network.

Sure, for years Macs have been able to share files with NetWare client PCs at faster-than-AppleShare speeds, print to PC printers, and use NetWare's backup and security features. But the Macs have been sharing the NetWare *server,* not the NetWare *network,* with PCs. It may seem like a matter of semantics, but this fact has limited the Mac's connectivity with PCs by keeping Macs from using hundreds of network applications that run on NetWare, including mail and backup programs, database managers, and management utilities.

Novell (800-453-1267 or 801-429-7000) is hoping to change this with a system-extension file called MacIPX, scheduled to ship this summer, that you drop into your System Folder. And get this — it's going to be free. IPX (internet packet exchange) is the protocol that runs Novell NetWare. MacIPX liberates the NetWare transport protocol from the NetWare server, giving Macs more and better access to NetWare services and providing easier and better Mac/PC networking in general — even without a NetWare server.

MacIPX will affect Mac users in three ways. First, Novell will use it to provide new NetWare services for the Mac. Second, Novell is promoting an API (application-programming interface) to enable third parties to build IPX in to their products, which means that PC software developers will be able to create Mac versions of their PC network software. The third effect will be that Mac software developers will also be able to build IPX in to their Mac software to give it better connectivity with PC versions of their software. At press time, Claris (408-987-7000) and ON Technology (617-876-0900), two early adopters of MacIPX, were planning to ship IPX versions of FileMaker Pro and Meeting Maker this summer.

Double Standards

Claris and ON Technology are jumping on the bandwagon so that their Mac and PC software will be able to run on the same network. The major network operating systems, however, currently impose a double network standard on their client machines — PCs get the native network-operating-system protocol, and Macs get AppleTalk. Novell's add-on software for the NetWare server, NetWare for Macintosh, is in large part AppleTalk for NetWare.

The problem with having Macs and PCs running on different networks is that PC software developers don't want to learn how AppleTalk works and therefore won't make Mac (or rather, AppleTalk) versions of their software. There are dozens of network applications Macs cannot access, even

though they may be connected to a Novell server.

IPX, on the other hand, has become somewhat of a standard and is used by PC network applications that run on NetWare servers, such as network-backup and database programs, as well as peer-to-peer applications that run without a server.

In addition, Novell's NetWare for Macintosh, although providing Mac users with excellent server performance and security features, is not practical for many situations. For one thing, its installation can't be spontaneous or even user-initiated. A single Mac user who wants to access the company NetWare server needs to convince a network manager to perform a nontrivial installation of more than a thousand dollars' worth of software on the server. It's often easier for the manager to replace the user's Mac with a thousand dollars' worth of PC hardware.

But with a MacIPX-compatible client application on your Mac, such as one Novell intends to develop, you'd just pop the MacIPX extension into your System Folder and the network administrator would have to do no more than add your name to the server's user list. The magic is that MacIPX enables IPX-aware applications running on a Mac to recognize native IPX data coming from a PC over the network. This is similar to the way Apple's MacTCP gives Macs access to TCP/IP networks. Macintosh users can communicate with PCs by using standard TCP/IP network services and TCP/IP-aware applications. Using either MacIPX or MacTCP — or both — does not exclude you from using AppleTalk, because the Macintosh is able to use several types of network protocols at the same time.

A simple system extension called MacIPX will give Macs more and better access to NetWare services and provide easier and better Mac/PC networking in general.

Foreign Services

At some point, Novell will provide in new MacIPX-based client software the printing, filing, and other services that are now available through NetWare for Macintosh. AppleTalk will remain an option for those who choose to remain with the current setup. Novell is also developing new network services that will require MacIPX for Mac clients. One of these is NetWare 4.0's directory services, expected to ship this summer. Directory services will let users access printers, E-mail, and other network services that reside on remote servers as well as get lists of users connected to other servers for sending E-mail.

Administration of Novell networks from a Mac, which is currently minimal,

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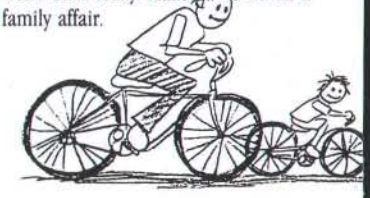

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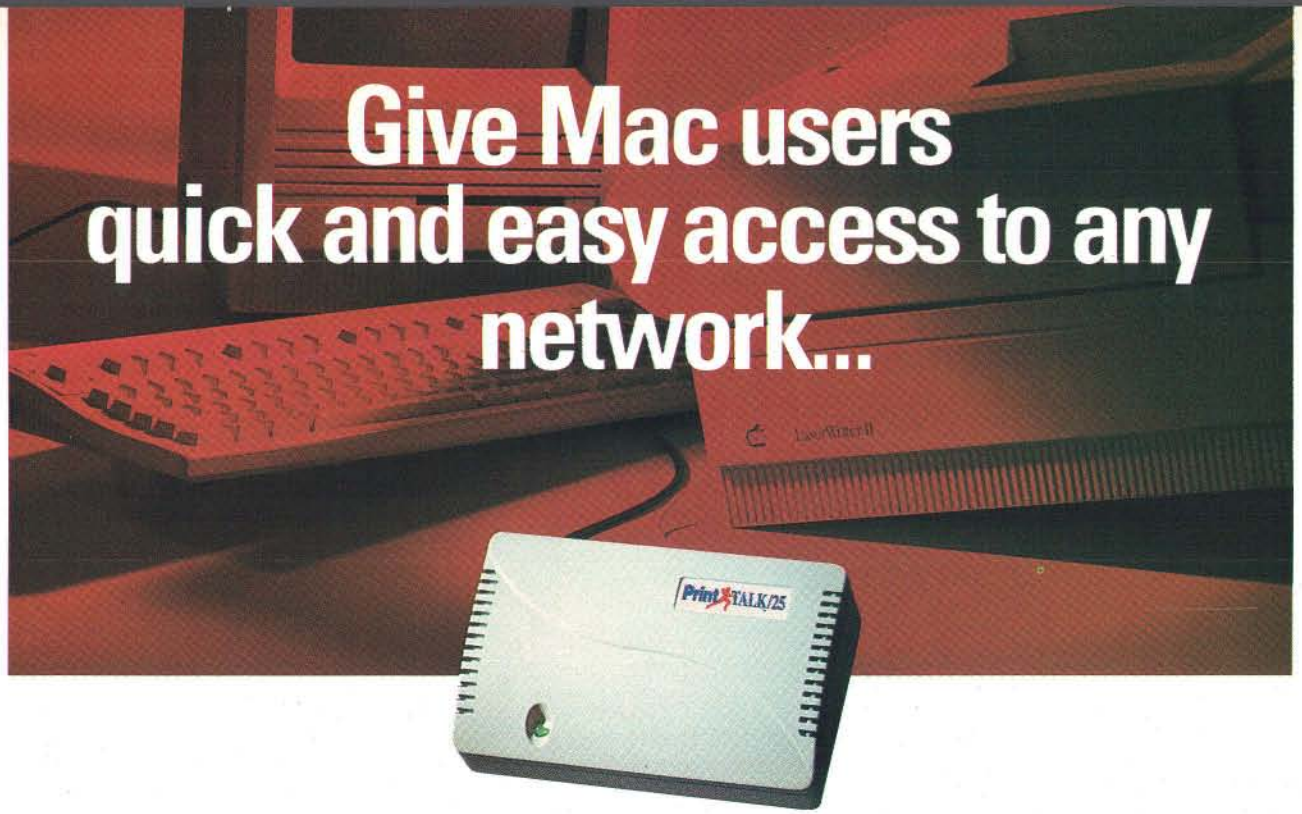

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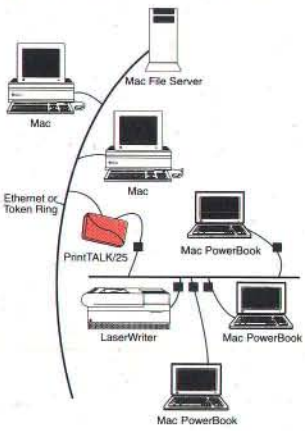

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	SPTLK25T	4/16Mb Token Ring DB9 and RJ45	AppleTalk	DIN8 LocalTalk	Up to 8 LocalTalk printers/devices	512Kb RAM 256Kb ROM	$1095
PrintTALK/200 available Q2/93	SPTLK200E/AN	Ethernet 10BaseT and BNC Thinnet	AppleTalk/ Novell	DIN8 LocalTalk, 1 parallel 1 Uniport	Up to 8 LocalTalk printers/devices, 1 parallel PostScript, 1 parallel or serial PostScript	2Mb RAM, 512Kb Flash ROM	$1295
	SPTLK200T/AN	4/16Mb Token Ring DB9 and RJ45	AppleTalk/ Novell	DIN8 LocalTalk, 1 parallel 1 Uniport	Up to 8 LocalTalk printers/devices, 1 parallel PostScript, 1 parallel or serial PostScript	2Mb RAM, 512Kb Flash ROM	$1495

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should be greatly enhanced by MacIPX. Although no one had made any announcements by press time, it's my guess that DOS-software developers will create MacIPX versions of network-management utilities that will enable you to do anything from a Macintosh that you can now do from a PC.

The *X* Word Again

Because IPX is not limited to use with centralized Novell NetWare servers, any publisher can enable its cross-platform application to use IPX to communicate between Macs and PCs without file servers. This is what Claris and ON Technology have done.

Claris' FileMaker Pro 2.0, version 4 ($399), which should be available soon, has full IPX support, enabling Mac users to access FileMaker Pro databases on Windows machines and Windows users to access databases on Macs. Claris has not written a special host version of FileMaker Pro — the program functions as normal. You access databases on an IPX network from within FileMaker Pro's Open File window. When you click on the Network button (called Hosts in the Windows version), FileMaker Pro provides a list of FileMaker databases on the network. Users aren't even aware of what type of machine the database resides on. Macs as well as PCs require the new version. FileMaker Pro also supports cross-platform database sharing on AppleTalk with PCs equipped with Farallon's PhoneNET PC.

ON Technology's Meeting Maker XP 1.0, which was to have shipped at the end of May, allows users on either platform to access group-scheduling servers residing on Macs or PCs. XP 1.0 is not an upgrade to Meeting Maker 1.5, which will continue to be sold, but more of a sidegrade. Although version 1.5 allows servers to communicate with each other, XP supports only a single scheduling server at this time. The product ships with ON Technology's own IPX driver but can work with Novell's MacIPX as well. ($695 for 5 users, $1,195 for 10 users, $5,595 for 50 users. Meeting Maker 1.5 users can convert to XP for $199 for 5 users, $299 for 10 users, and $1,120 for 50 users.)

Dayna (801-269-7200) and Insignia (415-694-7600) have each developed an IPX-for-Mac enabler, which they have been using in their products for several years. Dayna's NetMounter (now bundled with DOS Mounter Plus) and Insignia's SoftNode (NetWare client software for SoftPC, the company's DOS-emulation software for the Macintosh) each provide a specialized way of connecting Macs to Novell NetWare servers by using IPX, *without* NetWare for Macintosh.

Both of these products work, but they don't provide IPX connectivity for other applications that use MacIPX, such as FileMaker Pro. Creating an IPX enabler

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for the Mac is not an easy task, which is why we haven't seen more proprietary solutions. And with the MacIPX API providing most of the low-level hooks to the Mac operating system, I doubt we'll see many more.

Network Plumbing

Like MacTCP, MacIPX operates over LocalTalk, Ethernet, and token ring. MacIPX supports LocalTalk via encapsulation, a process that puts IPX data packets inside AppleTalk data packets. You need a multiprotocol router to do the encapsulation.

As a network protocol, IPX is surprisingly plug-and-play. Whereas TCP/IP requires a network administrator to type in the node address of each Mac, MacIPX uses the Ethernet or token-ring address that is in the ROM of each Mac's network-interface card. For LocalTalk, MacIPX uses a combination of the Mac's LocalTalk node address (which AppleTalk automatically assigns on startup) and a piece of the LocalTalk network number.

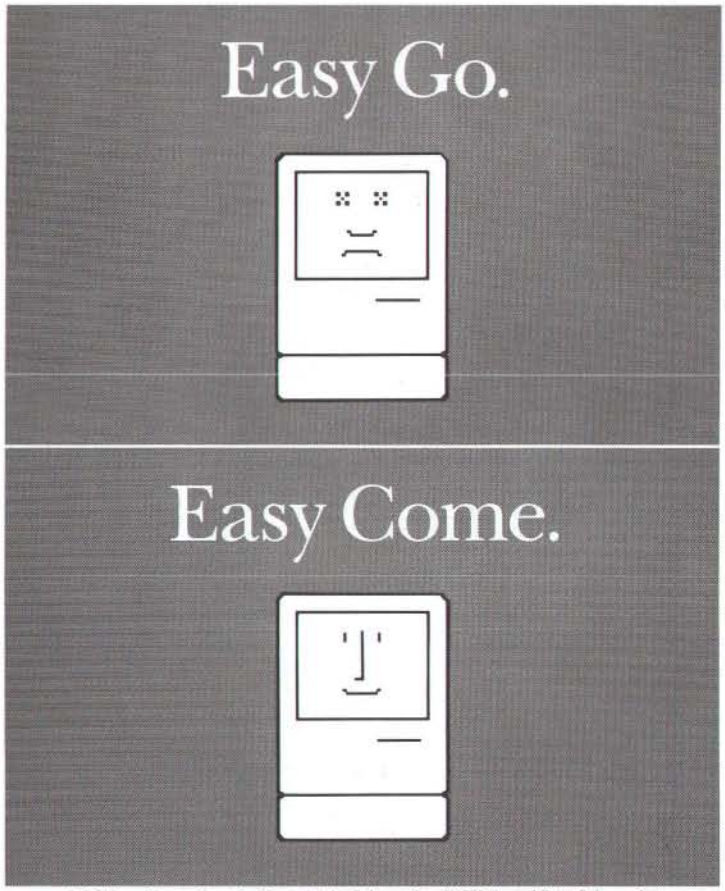
With the right software, MacIPX could be run over an AppleTalk Remote Access link, making a peer-to-peer telephone link with a PC much simpler than it is now: You'd dial in to a Mac running AppleTalk Remote Access and MacIPX.

With the advent of MacIPX, which doesn't change Mac or PC network-plumbing standards, IPX could change the way printing in mixed networks is set up. Peer-to-peer printing, where a printer is a node on a network, has long been common in the AppleTalk world, whereas most PC printers have to be connected directly to a server or to a PC. However, Hewlett-Packard may have started a trend when it recently put IPX into its LaserJet 4 printers for peer-to-peer printing for PCs. With MacIPX and an IPX version of the Chooser, Mac users could select these types of PC printers as easily as they select LaserWriters now. This would mean that AppleTalk would no longer be a requirement for printers in enterprise environments.

I'm not saying that AppleTalk will be replaced. AppleTalk will continue to be the main protocol for environments in which Macs dominate — products that put AppleTalk on PCs, such as Farallon's PhoneNET PC (which does work over Ethernet, after all), still make sense in such situations. AppleTalk will also continue to be used for those workgroup islands of Macs found throughout big corporate networks.

MacIPX will open doors for Mac/PC networking, particularly if more developers jump on the bandwagon. Will it fly? With Novell giving away the driver, selling the API developer's kit for a mere $295, and requiring MacIPX for some of its own services, odds are that it will.

***MacUser* technical editor John Rizzo's latest book, *How Macs Work*, is available from Ziff-Davis Press.**



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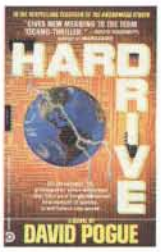
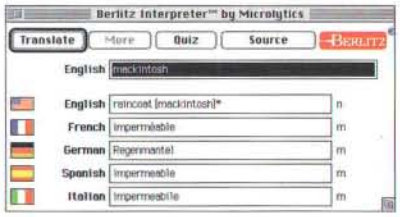
PERSONAL MACINTOSH

Poetic license to kill: Magazine editing has just a few serious occupational hazards, the two chief ones being failing eyesight and unsolicited poetry. When the eyesight went, we could always get glasses or contacts. The poetry, though, we had to suffer stoically. But that may change with the release of A Zillion Kajillion Rhymes, the aptly named $49.95 application that turns your Mac into a killer rhyming dictionary. A Zillion Kajillion Rhymes is the first product from Eccentric Software (206-628-2687), and I recommend it unreservedly to every aspiring poet who's ever submitted work to *MacUser*. With A Zillion Kajillion Rhymes at your command, your light verse will rise **like a soufflé** to such dizzying heights that, undoubtedly, you'll want to submit it to some other magazine. Please?

CD-ROM on holiday: Some sizzling CD-ROM titles for summer vacation: Compton's NewMedia (619-929-2500) is promising The Compleat Beatles, which is based on, and includes in QuickTime format, the video documentary of the same name. The title's a bit of a misnomer, but there'll still be plenty of worthwhile multimedia takes on Beatlogy, such as a Balloon Help version of the **Sgt. Pepper's** album cover that tells you who's who as you point your cursor at such famous faces as Shirley Temple's and Oscar Wilde's. $99.95. ▼ The Voyager Company (310-451-1383) has an interesting title coming too. Criterion Goes to the Movies uses QuickTime clips and annotations to survey the company's line of important films on laserdisc. $25.95. ▼ Finally, there's the 1993 Guinness Multimedia Disc of Records, from Grolier Electronic Publishing (203-797-3530). For $99, you get the complete text of the book edition along with QuickTime movies and extra photographs.



Summer reading: Looking for a high-tech paperback thriller that stars your favorite 68000-based computer? Look no further than David Pogue's *Hard Drive* (New York: Diamond Books, 1993), not to be confused with the decidedly unthrilling Bill Gates bio of the same title. This *Hard Drive* is the story of a computer virus that threatens Civilization as We Know It. You'll have fun recognizing thinly veiled companies and characters from the Mac community (**Talking Seal,** anyone?). $5.95. ▼ If you're going to vacation abroad, you might want to pack (along with your PowerBook) a PowerBook Berlitz Interpreter, from Microlytics (716-248-3868). This program can translate 12,000 words into or out of English, French, German, Italian, and Spanish. You'll need to provide just 800K of disk space. $49.95.



Just for fun: Oxyd, from Dongleware Publishing (617-497-1130), is a delightful collection of puzzles that combines arcade-style action with problem-solving challenges. If you want to try the game, you can download the software from most major on-line services. You'll need to buy the copy-protection **codebook** if you want to play beyond the first ten levels, though. The book is $39; the software disk is $4.

By James Bradbury

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Personal Time-Savers

Ready-made forms, templates, and specialized-document generators can save you time, money, and frustration. Here are some of the best.

By Bob LeVitus

Let's face it, "forms and templates" isn't one of the glamour topics of personal computing. Products such as the ones I'm going to tell you about just don't get the respect that whizbang spreadsheet programs, word processors, and database managers seem to command. But make no mistake, these are products you should know about, if for one good reason only: Each of them can save you time and effort. And the less time you have, the more you'll appreciate them.

I present these products with a single proviso: They aren't for everyone. If you have plenty of time on your hands or are broke beyond belief, they're not for you. It's obvious that you could create most of these documents from scratch if you had the time. But many of us don't have the time. Would *you* take the time to create a library of 80 fax cover sheets? Can you picture yourself preparing a full-blown business plan from scratch? I thought not. So if you need a library of fax cover pages, a record of everything important to you, a public-relations tool kit, a business plan, a will, a living trust, or a set of personnel forms, read on . . . .

Faxing Poetic

FaxMania, formerly known as Click-Art for Faxes, is a delightful collection of 80 fax cover sheets from T/Maker (415-962-0195). If you fax (and who doesn't these days?), you'll definitely love them. I'd be surprised if you didn't find at least half a dozen to use all the time.

Each page features a fanciful illustration, followed (or sometimes preceded) by vital information such as the date, the total number of pages, who the fax is from, and who the fax is to. Most pages have room for several paragraphs of text as well, so you can put your entire message right on the cover sheet, saving paper and transmission time.

I've gotten a lot of use out of these templates and lots of compliments on my clever faxes. Among my personal favorites are A Fax Called Wanda, which features, as you'd expect, a fish. Another favorite is the Bart Simpson fax — a picture of a smiling bovine accompanied by Bart's immortal words, "Don't have a cow, man!" There's a fax from hell, complete with faux flames, and a Just the Fax fax with a bull in a circle with a slash (use your imagination). For speed freaks, there's the Turbo Fax, complete with a drawing of a Porsche Turbo Carerra. There's even a fax that can bail you out of hot water — the clever flower fax, which includes a picture of flowers and the inscription, "All of the sentiment of the REAL thing: no vases needed, instant delivery, never wilts, no water necessary, you can make them any color you want, you can hang them on the wall . . . ." Trust me, it works.

That's just a small sampling. Each of the 80 cover sheets has a polished, professional look, and all the graphics are crisp line art that faxes beautifully. You can print them for use with your stand-alone fax machine or do what I do and use your fax modem to send them. For your convenience, each of the 80

ILLUSTRATION: LIN WILSON

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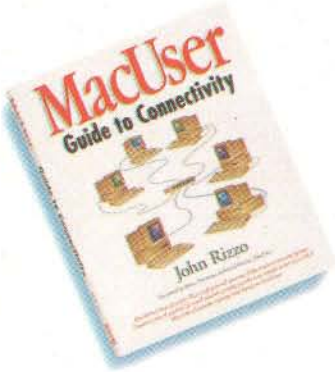

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cover sheets comes in four file formats — MacWrite, Write Now, Microsoft Word, and MacPaint.

I saved the best part for last: T/Maker recently lowered the price of FaxMania to an unbelievable $29.95 — less than 38¢ per cover sheet! I said it before, and I'll say it again: If you fax, you'll love FaxMania.

Getting Personal

Moving from fax to facts, Nolo's Personal RecordKeeper, from Nolo Press (510-549-1976), is an all-in-one home record-keeping system that gives you a place to collect all the facts about yourself and your family for just $49.95. Basically, it's a simple database program with a place for everything in its 27 categories and more than 200 subcategories. There's a place for emergency information, securities, insurance, hiding places, real estate, an inventory of the contents of your home, credit cards, personal documents, death plans, and a whole lot more.

The no-frills interface is easy to use, with a series of ugly but functional data-entry screens. Personal RecordKeeper is not a full-featured database manager, but it offers a simple Find command; password protection for the entire database or single categories; and net-worth and home-inventory reports you can view on-screen or export to the excellent finance program Quicken, from Intuit. The printing options are limited, but you can export an entire database or selected categories for polishing in another program.

Although I have no doubt that it's a good idea to have some kind of record of the hundreds of important little bits of information about my life and possessions, I gave up after about an hour, having completed only 2 of the 27 categories. My wife, kids, parents, and in-laws know most of this stuff, so why bother? Then I skipped ahead to the home-inventory section but gave up on it as well when I realized that it would take most of the day to fill out. (I videotaped every room in the house instead, a task that took less than half an hour.)

Don't get me wrong — there isn't anything wrong with the program itself. It does exactly what it's supposed to do. Personally, though, I found that having a record of every little thing about my life and possessions just wasn't worth the trouble, but that says more about what kind of person I am than it does about the software's quality. If this sort of record keeping sounds appealing to you (you know who you are), you'll love Personal RecordKeeper.

Going Public

Moving from the very personal to the very public, PublicityBuilder, from JIAN Tools for Sales (415-941-9191), is more than a collection of templates — it's a $129 public-relations tool-kit-in-a-box. If you know nothing more about public relations than that your company should be doing it, this product will serve you well. But even if you have a background in public relations, you'll find unique and thoughtful suggestions, exercises, and techniques.

PublicityBuilder is a full-blown crash course in public relations, codeveloped by JIAN and Daniel S. Janal, a successful public-relations professional. (According to the back of the box, Janal did PR for Amiga, Commodore, and Datapro. Take that with however many grains of salt you wish.) PublicityBuilder's manual is an adapted and expanded version of Janal's book *How to Publicize High Tech Products and Services: A Hands On Guide.* The book is a good one, full of introspective exercises, lucid definitions, and useful examples. Combined with the files on the disk, it gives you everything you need in order to mount your own publicity campaign.

The examples have a high-tech orientation, but the material can be applied to almost any business. The disk contains 41 documents, including 19 sample press releases and 22 worksheets, checklists, and forms. It has press releases for fund raisers, community events, restaurants, business events, new partners, sports leagues, and many more. Overall, the quality of the manual and the disk files is excellent. Whatever your product or service, you'll find plenty here — in the manual and on the disk — to serve your public-relations needs.

My only quibble is that the package is relatively expensive. I found several books on public relations at my local bookstore, with prices ranging from $10 to $25. Janal's book is good, but I'm not sure the disk is worth an extra $100. (Of course, if you go the book route, you'll have to type and format your press releases, worksheets, and checklists from scratch.) For those who can afford it, though, PublicityBuilder is a seamlessly integrated, all-inclusive PR kit.

The Best of the Rest

The three programs I've just reviewed are merely the tip of the iceberg. JIAN, for example, offers an entire line of Business Know-How on Diskette products. BizPlanBuilder ($129) includes word-processing and spreadsheet templates for a complete business plan. Other JIAN products include JobSketch ($99), a set of job-description templates; EmployeeManualMaker ($139), templates of employee policies and benefits; SafetyPlanBuilder ($139), for writing injury and illness protection plans; GreatForms ($129), 100+ ready-made business forms and financial worksheets; CashCollector ($139), letters, payment agreements, and court documents; and AgreeMentor ($99), business agreements for people, products, and property. They all look good, although I still think they're too expensive, except for BizPlanBuilder, which includes an excellent selection of spreadsheet templates with all the formulas already in place.

Another good source of templates is Heizer Software (800-888-7667 or 510-943-7667), which publishes a catalog featuring hundreds of inexpensive Microsoft Excel and Works templates. Many of them are priced at less than $25. Although you don't get a fancy manual or packaging, Heizer templates are generally an excellent value. Give the company a call, and ask for its catalog.

Nolo Press offers other document generators such as WillMaker and Living Trust in addition to the aforementioned Personal RecordKeeper. WillMaker ($69.95) generates a simple will that is valid in every state except Louisiana; Living Trust ($79.95) guides you through the creation of a probate-avoiding living trust. I had no trouble with Living Trust, but WillMaker crashed if 32-bit addressing was turned on and had a bug that forced me to run it from a floppy disk. Nolo acknowledges both bugs but doesn't say when or if they will be fixed.

WordStar International (800-843-2204 or 415-382-8000) has introduced a series of templates that includes Under Cover and Correct Letters, priced at an affordable $49 each. Under Cover is a collection of more than 100 fax cover sheets that are almost as nice as those in T/Maker's FaxMania, although WordStar's product costs more. Correct Letters includes more than 250 all-purpose business letters plus a nifty HyperCard browser that helps you find the right letter for the occasion quickly and easily. A bonus is that WordStar products include a 60-day money-back guarantee.

Personnel ReadyWorks ($119), from Round Lake Publishing (203-438-5255), is a one-stop personnel department — 160 personnel forms, checklists, reports, and agreements plus a manual of more than 300 pages based on *The Personnel Management Sourcebook*. The manual is thorough, and the templates are nice too. Round Lake also offers LetterWorks ($79.95), 400 professionally written letters for all areas of business; Sales LetterWorks ($79.95), 300 letters covering every phase of selling; Legal LetterWorks ($79.95), 165 legal forms; and Professional LetterWorks, 250 documents for professionals such as doctors, lawyers, and dentists.

Another nifty program I discovered is Pro Forma ($189), from Spreadware (619-347-2365), a mini-application built in Microsoft Excel that lets you automatically generate and analyze financial statements. It's completely automated and lets you perform what-if analyses quickly and conveniently. Dialog boxes and menus make the program easy to use even if you're not a financial expert or Excel wizard. Spreadware earned extra points with me by sending a bug-fix disk automatically and without charge and for answering the phone on the first ring.

Last but not least, for those who are on a particularly tight budget, plenty of shareware templates are available on CompuServe and America Online. BizPlanMaster ($34), by David A. Works (P.O. Box 4118, Whitefish, MT 59937; 406-862-1280; CompuServe 70400,153; America Online DAVIDW2959), is one of the best I've found — a complete set of Microsoft Word and Excel templates for creating a polished business plan. Because shareware is "try before you buy" software, you have nothing to lose by checking it out except a few minutes of downloading time. For more handholding, you can always spring for JIAN's BizPlanBuilder, which includes an excellent manual and step-by-step instruction in addition to its templates.

That ought to keep you busy. Me? I'm going to use JIAN's BizPlanBuilder to write a business plan for my seminar company!

Bob LeVitus is the author of *Dr. Macintosh*, second edition, and the creator of the popular How You Can Become a Macintosh Power User seminars.

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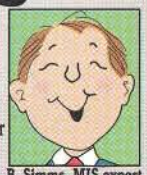
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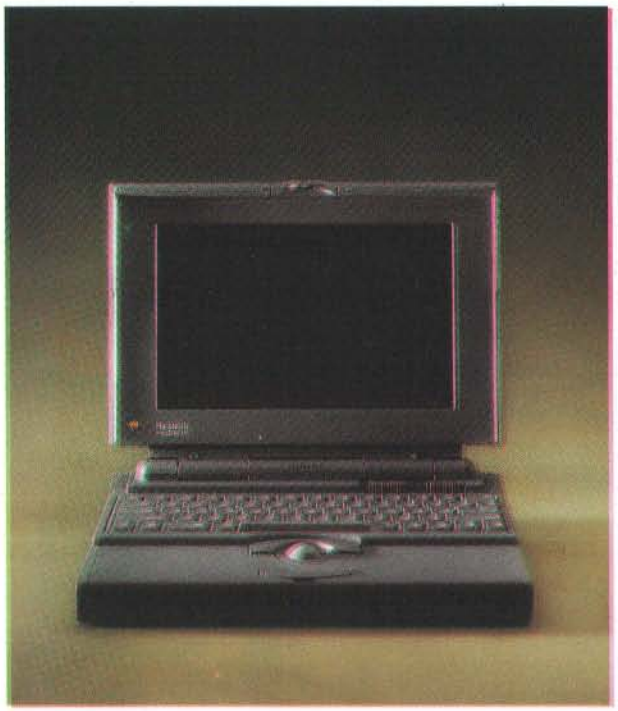

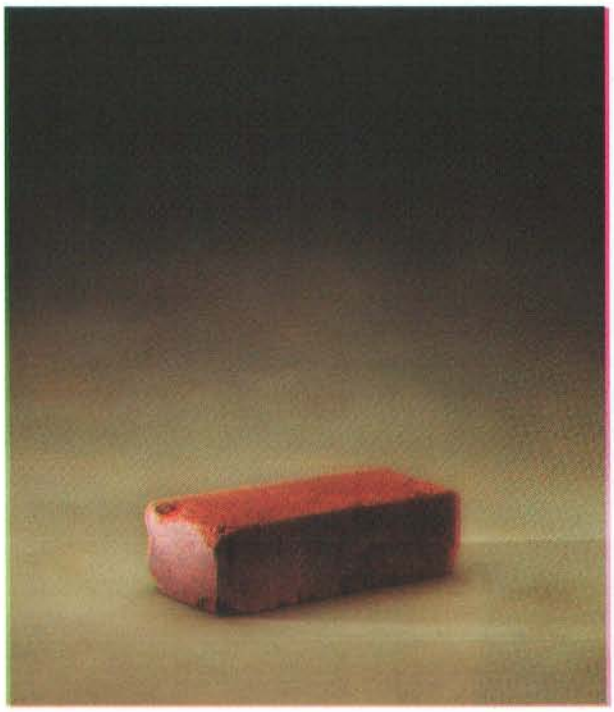

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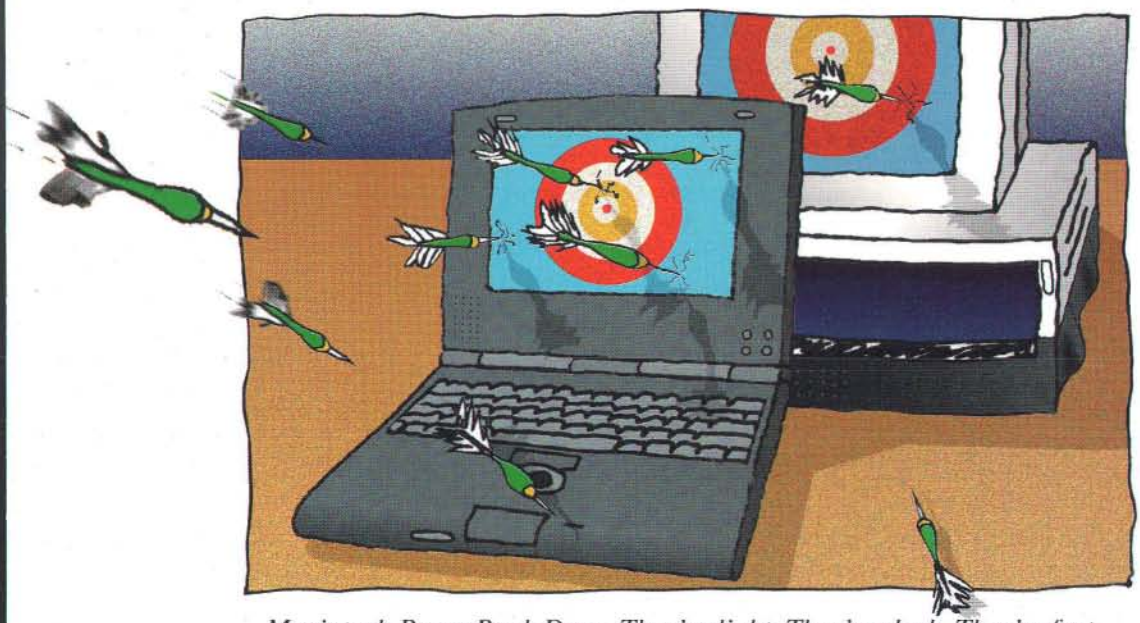
I Don't Want a Duo



Macintosh PowerBook Duos. They're light. They're sleek. They're fast. Here's why I don't want one.

By Henry Bortman

From the hype, you'd think PowerBook Duos were the greatest thing since sliced bread. And I *love* sliced bread. But I don't want a Duo. I know they're the lightest PowerBooks. I know they can do double duty as portables and desktop Macs by being docked to Apple's Duo Dock. But I'm not sold.

Hate the Screen

OK, I confess: My optometrist has been telling me for three years that it's time for me to get bifocals. I have trouble seeing up close. I need brighter brights, whiter whites, and blacker blacks. The Duo's passive-matrix screen just doesn't cut it.

Don't waste your time telling me how much better it is than other passive-matrix screens. I've looked at 'em all. Yeah, it's better. So what? Put it next to a PowerBook 180, with its active-matrix screen, crank them both up for maximum contrast, and tell me which one *you'd* rather stare at all day.

And another thing. I've got this funny little quirk: I like to see the cursor — even when I'm moving the trackball. Which reminds me . . .

Hate the Trackball

I've got stubby fingers. The Duo's trackball is too small a target for me to hit. Its surface area is too small to control. And it's sunk down in a well, so I feel as if my fingers are jumping off a cliff every time I go after it.

I like the heft of the 180's trackball. My fingers can find it. I can make the cursor go where I want it to. And it's at ground level.

Why did Apple hide the Duo's trackball down in a pit, anyway? Ergonomics? Or was it that its engineers designed the slot on the dock first and then had to sink the Duo's trackball so that the Duo would be slim enough to fit in?

Hate the Modem

It's a piece of junk. You probably could have predicted from Apple's track record with modems that the Express Modem was going to be a flop. You would have been right. I haven't met too many satisfied Express Modem users.

See, Apple decided to put half of the modem in hardware and the other half in software. The only problem is, the Duo can't quite coordinate the two. People tell me they never plan on staying connected for more than seven to ten minutes. The Express Modem doesn't seem capable of keeping a connection up longer than that. This is one way to restrict on-line-connection time, but I can think of better ones.

Then it's next to impossible to install. You have to take practically every screw in the Duo out — we're talking total disassembly — to put an Express Modem in. Don't even think of trying it yourself. And be prepared: Your dealer will probably charge you for two or three hours of bench time — you'll be lucky to get away with less than $100 in labor costs. So the

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amazingly inexpensive $319 modem suddenly becomes a $419 modem.

Don't get too excited about checking out the competition either. There isn't any. It's just not cost-effective for anyone else to compete with Apple's hardware. The price point of the Express Modem is so low that no one can make any money by offering an alternative.

Well, then, how about third-party software for the Express Modem? Don't hold your breath. Global Village is porting its GlobalFax software, but it remains to be seen whether it will make the modem perform any better than it does with Apple's software. Don't expect to see any of the whizzy new features other PowerBook modems are starting to get, such as OCR and voice, for the Duos. Most third-party vendors would rather write software for their own hardware, over which they can have more control than they do over the Express Modem.

The Duo will probably need a complete redesign before it can become a serious communications device. Today's Duos are dead-enders, practically obsolete before they roll off the assembly line.

Ironic, isn't it, that the Duo, which is supposed to be on the leading edge, pointing the way to the age of computing on demand — anytime, anywhere — has such compromised telecommunications capabilities that it will probably need a complete redesign before it can become a serious communications device. Today's Duos are dead-enders, practically obsolete before they even roll off the assembly line.

Love the Floppy Drive

But Duos don't have one! I use my floppy-disk drive all the time. I'm always installing new software (and, because of the frequency with which I crash my system, reinstalling system software). I don't want to have to carry around a dock (or a floppy-drive adapter), plus a drive, just to access a floppy disk. Besides, if you add the weight of a floppy adapter (.3 pound) and an external floppy drive (.5 pound) to that of a Duo (4.5 pounds), what do you get? A total of 5.3 pounds, a mere 1.5 pounds short of the 180's weight. If you're schlepping a MiniDock, instead of a floppy adapter, the total weight is almost 7 pounds.

Not to mention convenience. I'm meeting with a software vendor. She wants to install a beta version of a new application on my PowerBook. She can't leave me the disk; she has only one copy. I've got a Duo. I say, "Sure, let me just pull out my floppy adapter — and my floppy drive. Just a minute, I have to shut down my machine to hook all this up — oh, I guess I should turn off a bunch of my extensions and control panels so it will reboot faster. Hold on a sec, I'll just bring up Startup Manager and select my floppy-drive set . . . ."

You get the picture. Why would anyone want to live like this?

Hate the Price

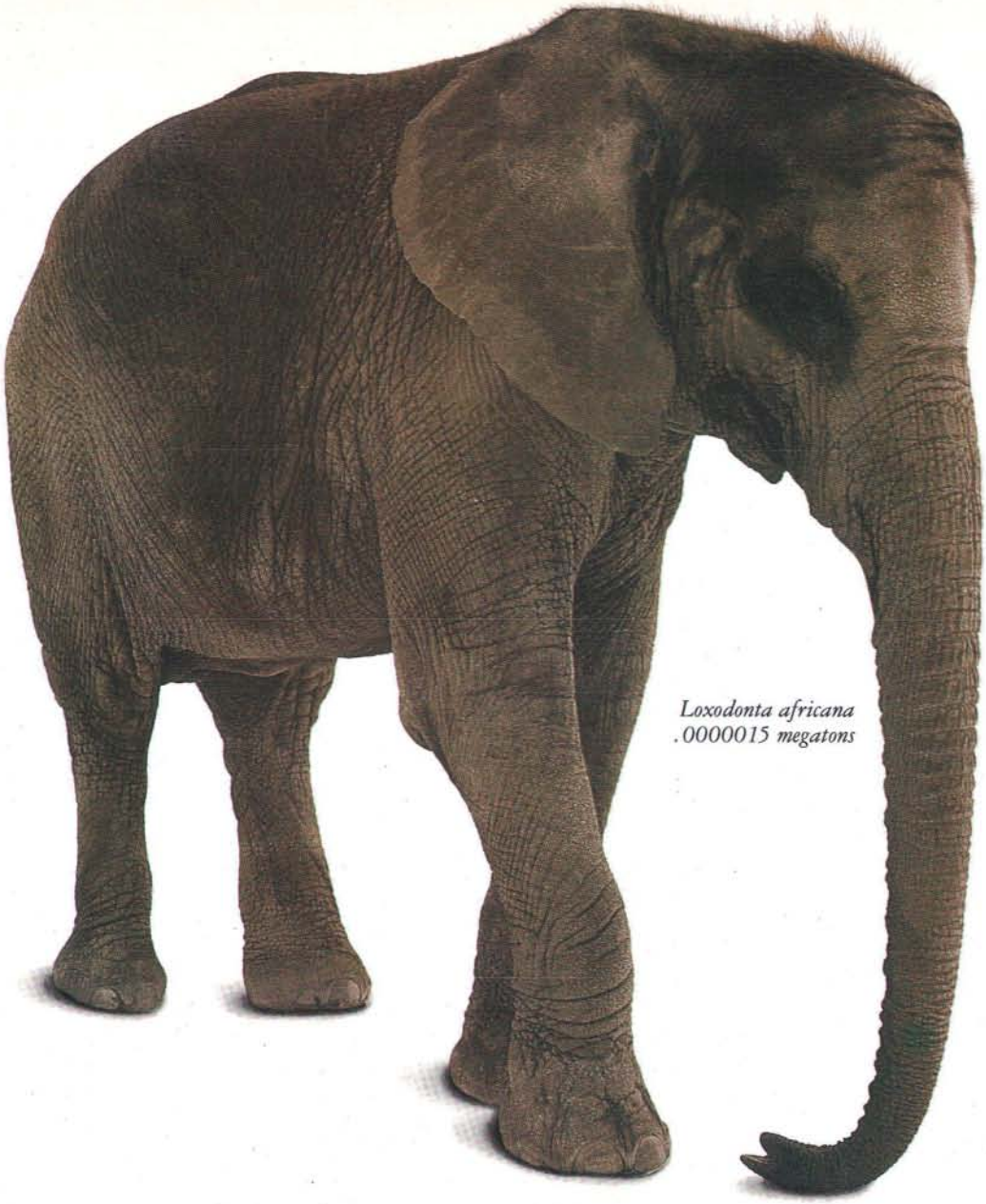
For simplicity's sake, we'll take the cheap route. We'll assume that your PowerBook is your only computer and that you're not going to get a Duo Dock or an external monitor. We'll start with the all-in-one model, a PowerBook 180 with 4 megabytes of RAM and a 120-megabyte hard drive. List: $4,469. Let's add $499 for a Global Village PowerPort/Gold modem. Total: $4,968.

Now let's do the Duo. We'll start with a Duo 230 with 4 megabytes of RAM, a 120-megabyte hard drive, and a factory-installed Express Modem ($2,899). I'll want to use it at home and at work, so I'll get myself two MiniDocks ($589 each). I'll also need a floppy drive ($199). But when I'm on the road, I don't really want to carry a MiniDock with me, so I'll get a floppy adapter too ($135). Grand total: $4,411. A $557 difference.

However, with the 180, I've got a screen I can see, a floppy drive that's there when I need it, and a modem that works. Is that worth paying an extra $557 for? You bet your sweet bippy, it is!

No sirree. I most definitely do *not* want a Duo. I'll take a 180 any day. Now if Apple could just make it about 2 or 3 pounds lighter . . . .

Henry Bortman is *MacUser*'s technical director.



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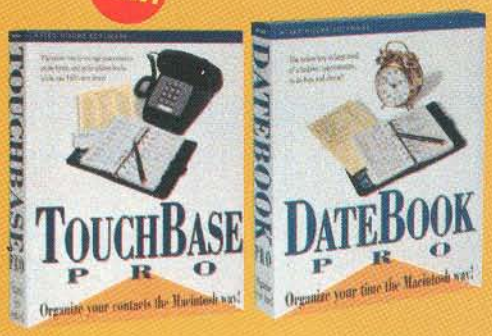

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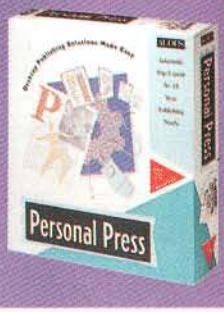

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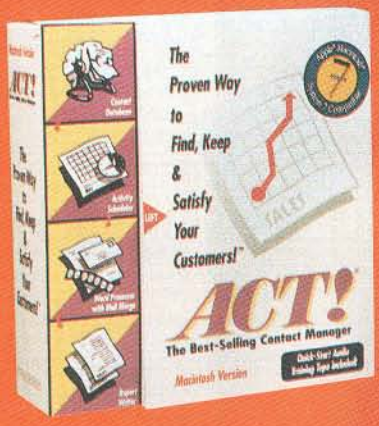

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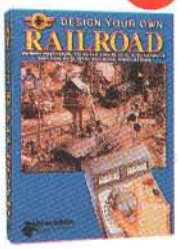

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How to Buy

Fax Software

■ You may not be stuck with the software that came with your modem. FAXstf, from STF Technologies (816-463-2021), is a **stand-alone package** that works with most fax modems; Global Village (800-736-4821 or 415-329-0700) sells its Global Fax for Duo Express modems.

■ Alternating between a printer and a fax modem with the Chooser is a hassle. Most fax software allows you to **bypass the Chooser** if you hold down a modifier key when you click on the File menu. This changes the Print command to Fax and temporarily selects the fax modem as the output device, with subsequent print jobs going to your default printer. An alternative is software that adds a separate Fax menu to the menu bar of all applications.

■ Recipients' names and fax numbers are stored in **phone books** for easy retrieval. Choose software that allows you to modify the phone book at the time you're sending a fax. If you already have a large database of names and addresses, find a phone book with strong import features. The ability to create multiple phone books is helpful for separating personal and professional contacts.

■ **Broadcasting** lets you send the same fax to multiple recipients, one call at a time. Look for phone books that allow you to group recipients into distribution lists.

Because many modems are similar in quality, focus your buying decision on price and the features of the fax software that comes with the modem.

■ Most fax software can send cover pages with the basic name, phone, and page-count information. Better programs allow you to enter notes just before sending. The best come with **cover-page editors** that let you modify text, graphics, and layout.

■ PowerBook users should insist on **smart-dial** capability, which compares the local area code with that of the recipient's area code and dials accordingly. Otherwise, without phone books for each location you send faxes from, your modem will incorrectly dial a 1 plus the area code.

■ If you'll use your fax modem in an office where you must dial a particular number to get an outside line, the software should have a place for you to specify a **dial prefix.** To charge fax calls, the **dial suffix** is the place to enter a credit-card number.

■ Desktop publishers and graphic artists need to send good-looking **gray-scale** faxes. Currently only MaxFax software, from Prometheus (800-477-3473 or 503-692-9600), can dither color and gray-scale images with stunning results, although such faxes take longer to transmit than text and line art do.

■ To save money, send faxes in low resolution (also called Draft or Fast mode) if your document uses fonts larger than 10 points and image quality isn't important. Look for software that can spool faxes or save them to disk and then let you **schedule** them for transmission at night.

■ **Enveloping** lets you fax documents from different applications to the same recipient. FAXstf's call-grouping feature sends all faxes pending delivery to the same recipient in one phone call.

■ Because fax-modem transmissions can be troublesome, real-time **status feedback** is important. During negotiations with other fax machines, the software should display the recipient's name, station name, and phone number as well as the speed, resolution, and page progress of the fax. A detailed **activity log** is also useful. It should record the status of incoming and outgoing faxes.

■ Most software lets you specify the number of times the modem should try resending a fax and how long it should wait between attempts. An even better approach is **smart resend,** which sends only those pages that didn't make it on the previous try.

■ Received faxes don't look good on-screen at actual size, so you need **magnification** capabilities. You may need to **rotate** or **flip** faxes that are sent to you upside-down.

■ Incoming faxes are saved on-disk as bit-mapped images that can be manipulated by graphics programs. To edit the text of received faxes, you must convert it with OCR **(optical character recognition)** software. Some fax programs have built-in OCR; another option is to use a stand-alone package.

■ For more on fax modems and software, see "Working Away," elsewhere in this issue, as well as "Fast, Full-Featured Fax Modems," May '91, page 104.

By Owen W. Linzmayer

If you're not using MacTools, this is how your disk is being repaired.

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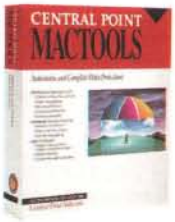

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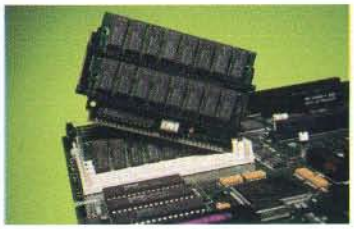
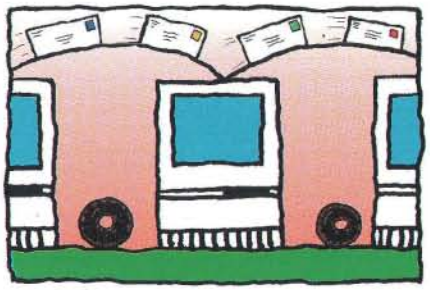
Upgrade news: Need more memory in your Mac II? MicroMac Technology has a beautifully simple solution with its SIMMdoubler II ($139 for a pack of four), a double-slot SIMM adapter that not only doubles the amount of memory you can install but also lets you **reuse old SIMMs** in a Mac II, IIx, IIci, or IIcx (you *can* use it in a IIsi, although it conflicts with some accelerators designed for that model). Even better, the SIMMdoubler II lets Mac II owners use standard SIMMs in the Mac II — forget about special PAL SIMMs — and you don't need a ROM upgrade to install more than 12 megabytes of RAM. 714-362-1000. ✦ If you got one of those **inexpensive IIsi's** and want to upgrade it, Digital Eclipse's si/ci Upgrade ($299) gives you IIci performance and fixes the IIsi's sound-dropout problem. 510-547-6104.

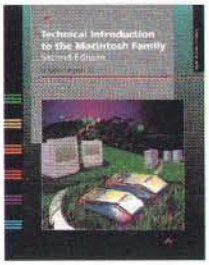


Note this: Every office needs E-mail, even if it's just to let the chosen few know that you have a **dozen chocolate doughnuts** in your office that need immediate attention. For small businesses that don't need or want a dedicated mail server, there are a couple of simple, low-maintenance options: ISIS Notes (5 users, $100; 10 users, $160; 50 users, $720), from ISIS International, lets you send messages (text or voice) and files across your network. It requires System 7 and is fully scriptable with UserLand Frontier or AppleScript. 818-788-4747. ✦ Snap Mail (5 users, $200; 10 users, $320; 50 users, $1,440), from Casady & Greene, works with System 6 and 7 and lets you send alerts and messages to coworkers. 408-484-9228.



Accounts receivable: Lawyers, writers, artists, architects, and other professionals who do their books on their Macs should check out Straight Shot, a new accounting program aimed at businesses that bill for services and allocate expenses to clients. At $1,200, it's not cheap, but to help you **make up your mind,** Lincoln Software is providing $25 evaluation copies. 617-259-8727.

Power books: For a program that's so easy to use, FileMaker Pro 2.0 can still leave database novices scratching their heads. *FileMaker Pro 2.0 for Macintosh* (Reading, Massachusetts: Addison-Wesley, 1993; $34.95), by Rich Coulombre and Jonathan Price, is a hefty tome that's a good reference if you're designing something a little more complex than a **business-card directory.** The enclosed disk contains sample databases and templates. 617-944-3700. ✦ If there's a software developer deep inside you struggling to get out, grab a copy of the second edition of the *Technical Introduction to the Macintosh Family* (Addison-Wesley, 1992; $26.95). It's dry, it's dull, and it's as **heavy as a PowerBook,** but this Apple-compiled reference will give you the technical grounding you need and suggests books for further study. 617-944-3700.



By Victoria von Biel

The Customized Mac

With the macro program QuicKeys, you can make your Mac do what you want, when you want. Here are seven ways to get the most out of QuicKeys.

By Adam C. Engst

One of the longest-running hits on the Macintosh scene has been CE Software's QuicKeys, a macro program that lets you automate repetitive tasks such as opening your address-book program or reformatting a document's text. But having this complex program do only those kinds of tasks is a little like hiring Arnold Schwarzenegger to do little more than take out the garbage once a week. To help you understand how QuicKeys can make your life easier, we've come up with seven ways of using the program that you may not have considered, with examples that you will find instantly useful. (QuicKeys is not the only macro-creation program. Tempo II Plus, from Affinity Microsystems, is another even more sophisticated choice.)

Figure 1 gives you a guided tour of the QuicKeys control panel, with definitions for each macro type you can create. Once you're acquainted with all the macros, read on for tips on how to use them.

ILLUSTRATION: JOHN CORBITT

Instant QuicKeys

CE Software is well aware that most people aren't using QuicKeys to its full potential. That's why the company created Instant QuicKeys, a program that walks you through creating shortcuts (see Figure 2). Many longtime QuicKeys users ignore Instant QuicKeys, thinking it's a tutorial aimed at rank novices. Not so fast. Think of Instant QuicKeys as an interview with a consultant who asks what you do and then creates custom shortcuts for you.

Unfortunately, Instant QuicKeys has its drawbacks. First, it's not really instant, and it can take you a while to work all the way through it. Second, if you're not careful, you'll end up installing more shortcuts than anyone could ever remember. Be *extremely* judicious when you're working with Instant QuicKeys, and install only a few shortcuts you know you will use. Finally, Instant QuicKeys suffers from a cluttered and clumsy interface. To avoid problems when you're using Instant QuicKeys, remember these points:

TIP For easier navigating, remember that the Continue button acts as a Create Shortcuts button and the Skip button serves as a navigation arrow.

TIP When you're creating shortcuts, the Remember button records your choices and moves you to the next section. The Cancel button cancels changes *without* moving you forward.

TIP Run Instant QuicKeys every few months, just to make sure you haven't overlooked a possible shortcut.

TIP To print a template of your QuicKeys, dig out the Template Printer utility, on QuicKeys' Extras disk. It includes templates for most common keyboards and can print a template that looks like your keyboard or one that fits over the function keys of an extended keyboard.

On the Menu

The most commonly used QuicKeys are Menu/DA shortcuts, which let you assign a keyboard shortcut to a program selected from the Apple menu or to a menu command within a program. Again, restraint is the fundamental here. Define shortcuts only for those DAs or menu options you'll actually use.

TIP Use the Menu/DA option to apply the same keyboard shortcuts to all of your applications. In my case, for instance, all my E-mail programs have the equivalent of an in box that holds my mail. Only one program — uAccess — has a keyboard shortcut (Command-I) for opening the in box, but I wanted to be able to use the same shortcut in CompuServe Information Manager (CIM) and America Online (AOL). By using QuicKeys' Menu/DA option, I was able to assign Command-I to the In Basket menu item in CIM and the Read Incoming Mail item in AOL, and now I don't have to think about which program I'm using when I want to read my mail each day.

✷ ***Warning:*** QuicKeys shortcuts *always* supersede application shortcuts. So although it may seem sensible to assign Command-O to CIM's Send Mail in Out Basket command and AOL's Read Outgoing Mail, remember that if you do so, Command-O won't work for Open anymore.

Also Known As

One of the simplest types of shortcuts in QuicKeys is also the most useful: the Alias option, which lets you replace one key's action with that of another. For example, I have an extended keyboard, which comes with the ever-useless Help key. Most of the time I hit that key accidentally when I mean to press on the Delete key, so I defined an Alias shortcut long ago that makes the Help key act as a second Delete key. Most programs let you access Help via a menu, so reassigning the Help key won't prevent you from getting on-line help when you need it.

TIP Use Alias shortcuts to enable F1 through F4 on an extended keyboard to actually perform the undo, cut, copy, and paste tasks for which they are labeled. To assign Undo to F1,

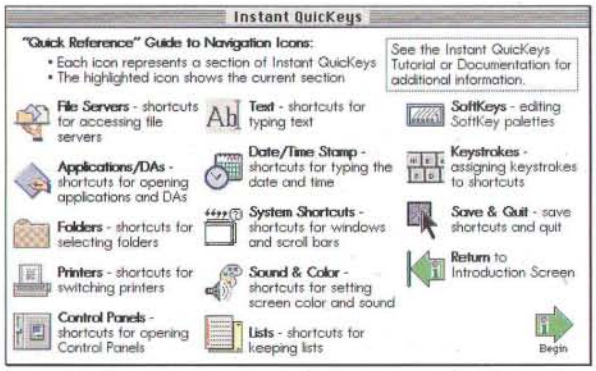


Figure 2: If you're new to QuicKeys or need to brush up on your macro skills, try the Instant QuicKeys program, which walks you through macro creation. Just don't get carried away and create more QuicKeys than you'll ever use.

Figure 1: Types of QuicKeys

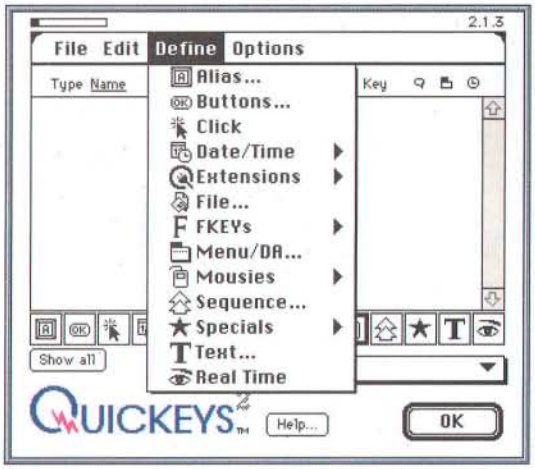


Figure 1: You can create several types of QuicKeys. Here's what's available:

Alias lets you assign the action of one key to another (assigning the delete function to the Help key, for example).

Buttons lets you create macros that click on buttons in dialog boxes — OK, for example, or Cancel.

With Click, you record mouse clicks and drags.

Date/Time inserts the date and time into a document.

QuicKeys comes with several Extensions, which add more functions to the program.

The File option lets you create a macro that launches programs and documents.

With the FKEYs option, you can redefine Fkey shortcuts such as the Command-3 print-screen Fkey.

The Menu/DA option lets you create macros that select items from menus.

Use Mousies to create macros for the actions of such keys as Page Up, Page Down, and Home.

The Sequence option lets you string together individual shortcuts into one multipart macro.

Specials lets you specify keystrokes for such commands as Restart and Shut Down.

Text lets you create a glossary of boilerplate text (return address, for example).

The Real Time option creates macros by watching your actions and replaying them exactly. Use with care.

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DATABASE HITS: NOBODY MISSES

It's a hit! Five "do it yourself" databases are evaluated by a leading database expert for ease of installation and set-up, importing, exporting, indexing, and ease of report generation. This is required reading for small business buyers who need a simpler flat-file or relational database. MacUser gives buyers the data to base buying decisions upon.

CD ROM DRIVES: THE MARKET

The ZD Labs takes 5 CD ROM drives for a spin, evaluating them against a wide set of critieria: speed, ability to access small and large files, multi-session compatibility, and double spin technology. This is a thorough reexamination of our March '93 report; all but one drive have been upgraded. MacUser drives buyers to make the right buying decision.

TWO THUMBS UP: DESKTOP VIDEO

The critics agree – desktop video is hot! Five digital video editing systems are examined, ranging in cost from $3500-$20,000. Find out what's behind this revolutionary editing technology, which brings high quality production to multimedia authors, professional video editors and post-production facilities. Depending on what you do, MacUser tells you what's best for your needs.

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for example, simply open the Alias dialog box, name the macro, and then type Command-Z as the key combination and F1 as the keystroke.

QuicKeys Tells Time

It's 10 P.M. — do you know what your computer is doing? Most shortcuts can work at specific times or repeat at various intervals — just click on the Time Options button at the bottom of the dialog box when you define a QuicKey.

It's 10 P.M. Do you know what your computer is doing? Most shortcuts can be set up to work at specific times or to repeat at various intervals. Just click on the Time Options button at the bottom of the dialog box.

TIP Use QuicKeys as a simple reminder program by creating a timed Message QuicKey that tells you, for example, to back up your hard disk every Friday afternoon. Now, make sure you have the Message extension installed (see the "Extend Yourself" sidebar for detailed instructions), then choose Extensions from QuicKey's Define menu, and select Message. You can then create a custom dialog box with your message in it, complete with OK and Cancel buttons (see Figure 3).

TIP Because you can activate any shortcut at a specific time, timed QuicKeys work wonderfully with on-line services such as America Online or CompuServe. Just create a timed macro that launches AOL a few minutes before an automated FlashMail session is due to start. (For more on automating tasks to run on your Mac while you're somewhere else, see "The Moonlighting Mac," March '93, page 233.)

In Sequence

Once you've mastered basic one-step QuicKeys shortcuts, it's time to check out *sequences,* macros that perform multistep tasks at a keystroke. For instance, Microsoft Word and Aldus PageMaker both lack character styles, which let you use a single command to specify the font, type size, and type style of a word or phrase, but you can use a QuicKeys sequence to do it for you. If the body text of your publication is in 12-point Times roman but you want to have all dates and times in 14-point Helvetica bold italic, you can create macros for four individual menu shortcuts (selecting the new size, applying a new font, applying the italic style, and applying the bold style). You can then use the Sequence command to gather those four actions into one macro you can activate with a single keystroke.

TIP Use sequences to link one application to another. For example, I have a sequence that copies a text field from a Panorama II database, switches to Nisus and creates a new word-processing document, pastes the data into the document, and then saves the document on my desktop (see Figure 4). When I finish editing in Nisus, another QuicKeys sequence copies all the data in my Nisus document, switches over to Panorama II, pastes the changed data over the old version, and saves the database.

✷ ***Warning:*** Avoid creating Real Time

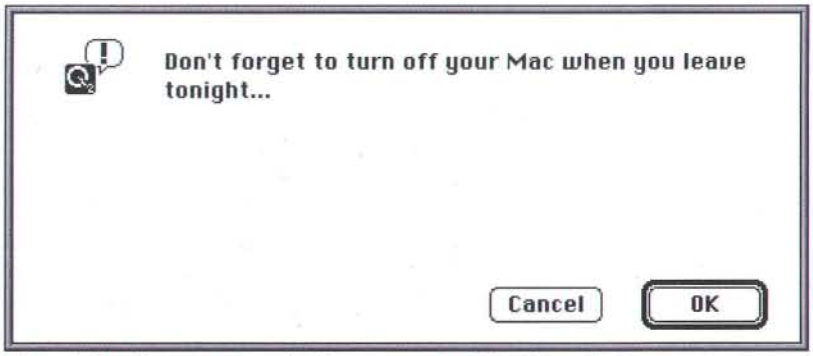

Figure 3: The Message extension lets you create dialog boxes that pop up at predefined times.

sequences, which you can create only in a "watch me" mode. You can't edit them, and they run exactly as slowly as you recorded them. You should also avoid defining sequences by having QuicKeys record your actions via the Record Sequence command (on the Apple menu, under QuicKeys). QuicKeys does not always select the right type of shortcut, and the sequence may contain redundant steps you should edit out immediately. My preference is to build sequences manually by combining single shortcuts; the resulting multistep macro is the cleanest, fastest, and easiest to understand for later editing.

Automatic Click-and-Drag

One of the hardest QuicKeys options to use effectively is Click, which records a mouse click in a certain position, letting you do such things as select tools from a tool bar or click on items and drag them around on the screen. Click is tricky to use, because things rarely stay in one place on Macintosh screens and Click QuicKeys are defined by the mouse's position on-screen.

TIP If you have a big monitor, it can be a pain to drag files all the way down to the Trash, but you can create a shortcut that throws files out for you. First, duplicate a file so you have something to throw away safely. Then go to your Apple menu, and in the QuicKeys submenu, choose Record One QuicKey (you'll see a microphone icon flashing over the Apple logo). Click on your junk file, and drag it to the Trash. QuicKeys will present the creation dialog box for a Click shortcut; in that dialog box, click on the Click button to bring up

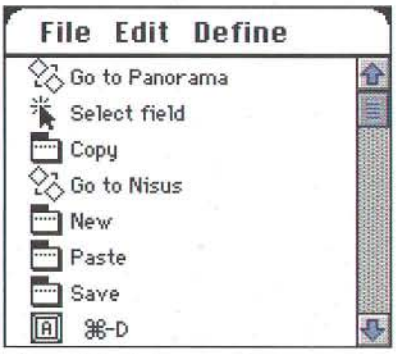

Figure 4: Techniques such as program linking and sequencing let you create QuicKeys that switch among programs and carry out complex tasks such as copying text out of one program and pasting it into another.

Extend Yourself

You can add functionality to QuicKeys by using optional modules called extensions. Unlike system extensions, which live in the System Folder, QuicKeys extensions add features to QuicKeys — letting you mount volumes, change your monitor's bit depth, select a different printer, and so on. What I like most about CE's 30+ QuicKeys extensions is that they *are* optional — if you don't want to use them, you don't have to waste disk or RAM space installing them.

QuicKeys includes a program called Extension Manager (don't confuse it with the free program from Apple called Extensions Manager, which helps you manage System extensions). Extension Manager looks a bit like the old Font/DA Mover, and you use it to install QuicKeys extensions as well as to turn them on or off. I recommend that you install all the extensions you think you might use but turn off those you won't use right away (extensions that are turned off don't use memory). There are so many extensions that I can't go through all of them here, so I'll just hit the highlights. Check out the QuicKeys manual for details on other extensions.

Choosy lets you switch among printers without opening the Chooser — very handy if you use both a printer and a fax modem.

The **Display** extension lets you pop up a word-processing document that you use as a to-do list or for notes from phone conversations, for example.

System 7 Specials requires the CEIAC application that comes with QuicKeys. System 7 Specials includes shortcuts that toggle Balloon Help on and off, start and stop file sharing, and switch to the next application or the last one you launched.

Grab Ease copies a selection to a *clip*, a file buried in the Preferences folder in your System Folder. You retrieve clips by using **Paste Ease** or **Type Ease.** Use these three extensions for managing boilerplate text and graphics. Paste Ease is faster than Type Ease and can handle graphics as well as text, but many applications can't work with it.

Which Printer flashes a 1.5-second message that tells you which printer is currently selected — useful if you use several networked printers.

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the Click Location dialog box (see Figure 5). You want QuicKeys to click relative to the mouse position (which tells QuicKeys to drag from the mouse location) and drag relative to the screen (doing so tells QuicKeys to always drag to the Trash). I gave my shortcut the key combination Control-Delete, and now when I want to throw something away, I just select a file (or files) and press Control-Delete.

✱ ***Warning:*** This shortcut won't work if you move the Trash icon from the position it was in when you created the QuicKey.

Take Note

QuicKeys can do things you may not have even thought of before such as popping up a notepad whenever you need it so you can get rid of all those Post-it notes stuck on your monitor.

Here's how: Using any word processor, create a file called Ideas and save it as text. Open QuicKeys, go to the Define menu, and choose Display from the Extensions submenu (you must have the Display extension installed). Click on the Select button, choose your file, name the shortcut, and give it a keystroke. Every time you invoke this shortcut, your Ideas file will instantly appear.

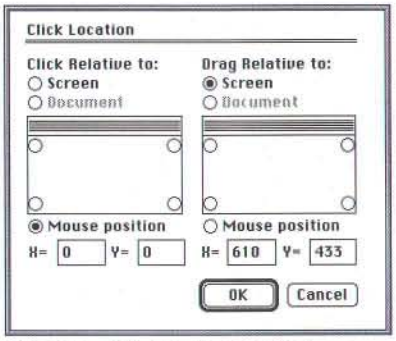

Figure 5: Click QuicKeys let you automate click-and-drag sequences. They're good for such tasks as selecting tools in palettes or trashing files.

TIP Set a Display shortcut to open automatically a minute after your Macintosh starts up so your list of to-do items, phone notes, or deep thoughts is right in front of you when you sit down in the morning.

Read On

If you've developed a taste for macros and want to find out more, a good way to start is by experimenting with a few QuicKeys tricks yourself.

For even more information, check out *The Little QuicKeys Book,* by Steve Roth and Don Sellers (Berkeley, CA: Peachpit Press, 1992; $18.95). Its 260 pages contain every single QuicKeys tip you could ever hope to find.

Adam C. Engst is the editor of the on-line magazine TidBITS. You can reach him on CompuServe at 72511,306.

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Upgrading the

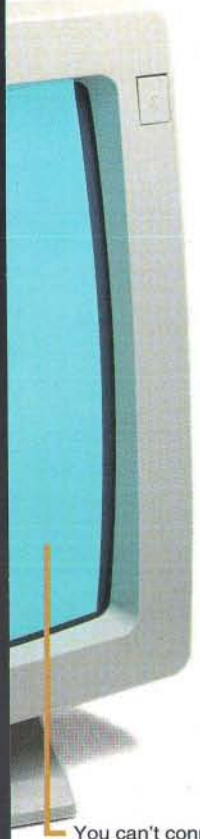
PowerBook 140

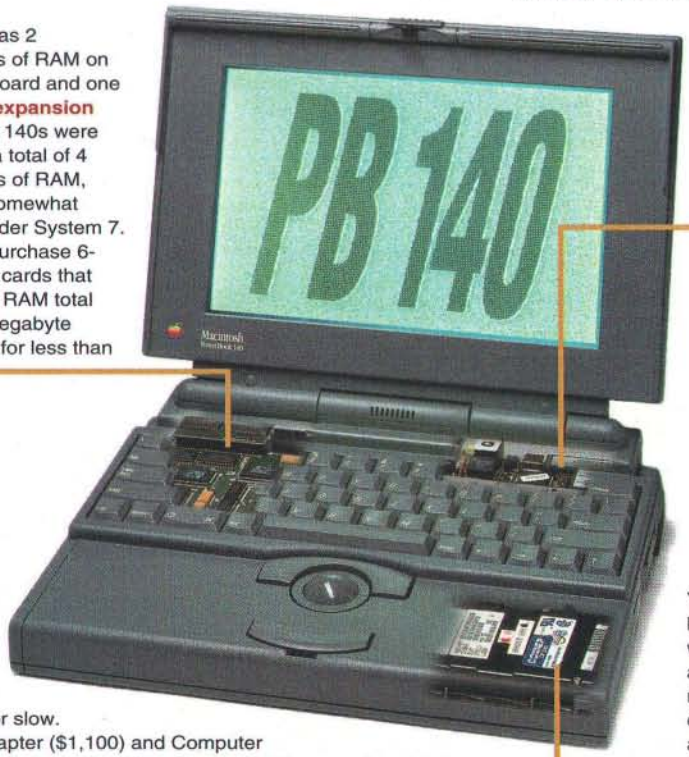
If you thought you could never upgrade your PowerBook 140, here's some good news: You can get faster speed and other goodies for a surprisingly low price.

By Tom Petaccia

The PowerBook 140 packs the performance of an LC II into a desirable notebook format. Powered by a 16-megahertz 68030 processor, the 140 is fast enough for many typical PowerBook tasks — electronic mail, word processing, contact management, and spreadsheet and database work.

However, if you find yourself doing DTP, on-screen presentations, or other CPU-intensive tasks, speed will become an issue. Apple has not, as yet, provided an upgrade to the 140, but thankfully, someone has stepped in to fill the void. Digital Eclipse Software (800-289-3374 or 510-547-6101) offers the F/25 upgrade, which adds a 25-megahertz 68030 processor with a 68882 math coprocessor to the PowerBook





A PowerBook without an **internal fax modem** is like a lamp without a light bulb. Fax modems give you a long-distance connection with your office or clients, and the faster the modem, the better. The good news is that 14,400-bps V.32bis (high-speed compression) fax modems are relatively inexpensive. Several vendors have excellent internal fax modems with software in the $300-to-$450 range.

The 140 has 2 megabytes of RAM on the logic board and one **memory-expansion slot.** Most 140s were sold with a total of 4 megabytes of RAM, which is somewhat limiting under System 7. You can purchase 6-megabyte cards that bring your RAM total to the 8-megabyte maximum for less than $260.

You can't connect PowerBook 140s to **external monitors** or overhead-projection units, and third-party solutions are expensive or slow. Envisio's Notebook Display Adapter ($1,100) and Computer Care's BookView Imperial ($900) fit into the PowerBook's RAM-expansion slot and come with additional RAM. SCSI units from Radius (PowerView, $550) and Sigma (PowerPortrait, $700) are lower in price, but the PowerView's screen-redraw rate is slow and the Sigma is limited to monochrome output.

Your PowerBook 140 probably has a 40-megabyte **hard drive,** which is easy to fill up. You can add an 80-megabyte, 120-megabyte, 160-megabyte, or even 200-megabyte drive for anywhere from $350 to $1,000. (Note: PowerBooks cannot take advantage of SCSI-2 speeds, so don't let that option influence your decision.)

140's daughterboard. This takes the 140 to the speed of a PowerBook 145, or the equivalent of an LC III.

At $399, this is one of the better bargains you'll come across. However, you must send your PowerBook to Digital Eclipse to have the upgrade performed. Two-day pickup and delivery charges are included in the price (overnight express is available for an additional $50). The upgrade itself takes one to two days.

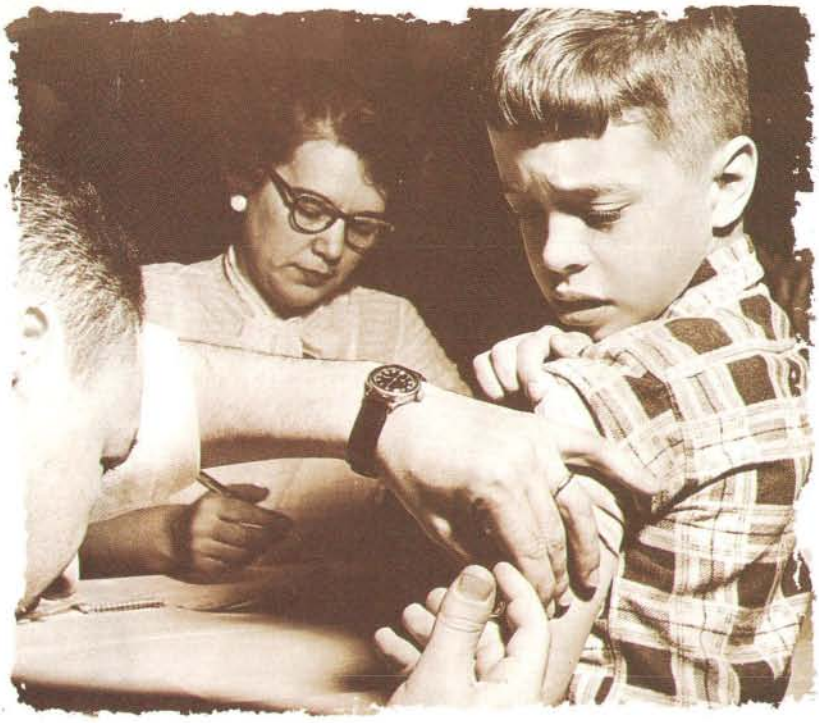
If you're using an Apple PowerBook Battery Recharger, consider some of the better-quality third-party products that totally discharge the battery before recharging it. This eliminates the memory effect that occurs when a battery is charged in the PowerBook or in Apple's recharger. Companies to check out are Battery Technology (213-728-7874), Lind Electronic Design (800-659-5956 or 612-927-6303), and The Madson Line (800-851-1551 or 415-927-3600). Battery Technology also makes a high-capacity battery ($69.95) that lasts 10 to 25 percent longer than the Apple battery.

If you're thinking of adding memory or a bigger hard drive to your PowerBook and want to do it yourself, you should be aware that Apple frowns on users performing their own PowerBook surgery (whatever is left of your warranty will be gone once you've opened the unit). Unless you are extremely confident, you may wish to purchase all of your internal upgrade items first and then take them to your local Apple-authorized technician to install. No matter how much you have the technician install, it shouldn't take more than an hour.

Apple Computer has not, as yet, provided an upgrade to the PowerBook 140, but thankfully, someone has stepped in to fill the void.

For about $650, you can maximize your RAM and accelerate your PowerBook 140 to 160 or 170 speeds — a great bargain. For another $500, you can double the standard hard-disk capacity — still not too bad for a configuration that should be plenty for most PowerBook users.

However, if you are also thinking of adding video-out capabilities (another $600 to $1,100), you may as well get a new PowerBook. For a street price of less than $3,000, you can get a PowerBook 160 with 8 megabytes of RAM and an 80-megabyte hard drive, complete with a gray-scale screen and direct video-out. In such a case, it may be better to sell the PowerBook 140 ($1,400 for a 4/40) and start from scratch.



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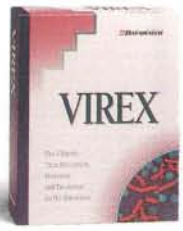

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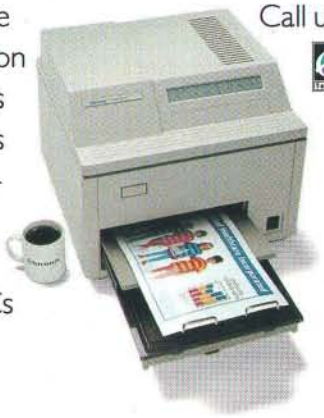

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CIRCLE 132 ON READER SERVICE CARD.

HELP FOLDER

Questions, anyone? Here's where to get answers from the experts. Bob LeVitus and Andy Ihnatko are the authors of the best-selling *Dr. Macintosh's Guide to the On-Line Universe.* Andy Ihnatko is also a longtime activist with BCS•Mac. They're ready to answer your questions about everything Macintosh. Write to Help Folder, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Don't want to wait for an answer? Post your question on ZiffNet/Mac, *MacUser*'s on-line service, and get a reply from Bob (76004,2076), Andy (72511,204), or one of the other *MacUser* experts. See the masthead in this issue for instructions on how to sign up.

By Bob LeVitus and Andy Ihnatko

Overstrike Out

Bob: First, a correction. When I explained how to use Microsoft Word's formula character to make macrons (see Help Folder, April '93, page 253), I wrote, "type Command-Option-backslash, followed by the character that will have the macron." I should have written, "Type Command-Option-backslash followed by the letter *o*." The letter *o* stands for *overstrike*. So, for example, to overstrike the letter *u* with a macron, type `\o(-,u)`.

Reader Peter Janick sent in a neat trick that makes Word's formula function virtually painless: Split the window into two panes. Scroll to the same place in both panes. Click anywhere in the lower pane, and choose Page Layout from the View menu. Make sure invisible characters are showing (choose Show ¶ from the View menu). Now edit your formula in the upper pane, and the results will be displayed immediately in the lower pane. This trick is especially good for adjusting the superscript setting in the Character dialog box.

The Circular File Cabinet

Q. I recently bought The Norton Utilities for Macintosh and have discovered a wonderful feature. You can actually pull items out of the Trash after you've emptied it! Because I can recover data this way, isn't it possible to expand the size of my hard disk by storing old, infrequently used data in the Trash and using Norton to undelete the data when needed?

Kevin Michael Morgan
Oklahoma City, OK

Bob: No, no, no. *Never* use the undelete feature of programs such as The Norton Utilities for Macintosh, Central Point's MacTools, or Fifth Generation's Public Utilities to archive files you may someday need (see Figure 1).

Here's why. When you put a file (let's call it FILE1) in the Trash and then issue the Empty Trash command, FILE1 is not really erased. Although it has been removed from your disk's directories

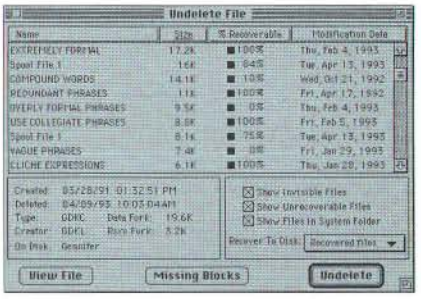

Figure 1: Trashing a file doesn't mean it's gone forever. Guaranteed Undelete, Public Utilities (shown here), MacTools, and Norton Utilities let you recover some trashed files.

✻ . . . But Were Afraid to Ask

As Samuel Johnson once said, "It is by studying the little things that we attain the great knowledge of having as little misery and as much happiness as possible." It is in that same spirit that we here at Help Folder dedicate space every month for basic, simple questions. To protect you from the coarse gibes of the ignorant masses, we'll say that the question was sent in by a person whose many talents may well have been enjoyed by Dr. Johnson himself.

Q. What exactly are the differences between System 7 and System 6? System 7 came installed on my Performa, but I've heard some people claim that System 6 is far superior and they wouldn't give it up for the world.

Louisa Lewis
Covent Garden Theater

Andy: System 6 is the plain-Jane, vanilla Mac operating system that is largely the same version as the system and Finder that were released years ago, with amendments added every year or so as the technology mandated it. System 7 (which was introduced in 1991) was a complete rewrite from floor to ceiling and, as many of its users know, represented Apple's first solid attempt to infuse the system and Finder with new life, giving the old horses some new legs, allowing them to gallop into the next century, as it were.

Which operating system you use depends on what you want to do with your Performa. If you want to work with applications and documents, use System 7. If, on the other hand, you want to turn the machine on; see an error message that says you can't use System 6 with your machine; and then shrug your shoulders, turn off the Mac, and go and play a nice round of golf, then System 6 is right up your alley.

That's what it boils down to for most people who bought their Macs within the past two years; there are roadblocks to using any version of the system earlier than 7.0. Many folks with older machines prefer to use System 6, chiefly because it requires about half as much memory as System 7 and has a little more than a third of System 7's disk-space requirement. They could also be using a bowling-alley-management program written in 1986 that doesn't run under System 7.

But System 7 has its own advantages. Namely, 32-bit addressing, which among other things, allows your Mac to work with more memory; virtual memory, which bamboozles your Mac into thinking that hard-disk space is actual system memory; built-in ability to share files across a network (called file sharing); and free T-shirts with the System 7 logo, which were handed out at the product rollout. There are other features and advantages to System 7, but these are the biggest ones, and if they still harass you after this, you may prod them with pointed sticks until they go away.

Figure 2: If every program you use has its own spelling checker and dictionary, you can get rid of the clutter by switching to a universal spelling checker such as Baseline's Thunder 7.

and the Finder can't see it, FILE1 still occupies the same space on your disk as it did before you trashed it. Your Mac *thinks* that that space is empty and will want to reuse it eventually, at which point it will write (save) a file to that space and erase FILE1 permanently, making it completely unrecoverable.

The biggest factor is how many files you've copied or saved to your hard disk since you emptied the Trash — the more new files, the likelier your deleted files are to be unrecoverable.

Don't use it for archiving files, but if you want to recover trashed files, you should check out Guaranteed Undelete ($79.95), from Utilitron (214-727-2329), which goes Norton, MacTools, and Public Utilities one better by tricking your Macintosh into overwriting only the oldest files. Otherwise, the Finder will overwrite trashed files at random — for example, a file you trashed this morning might be overwritten, whereas a file trashed weeks ago may be recoverable.

And don't forget: Always back up the contents of your hard disk religiously. It's the only way to protect important data.

Andy: Here's the bottom line: If you want more hard-disk space, buy a Finder-level background file-compression utility such as Aladdin's splendid SpaceSaver. Better yet, stick a crowbar into your wallet and buy a bigger drive.

Drag-and-Drop Dead

Q. I really like the idea of System 7's drag-and-drop file launching. Unfortunately, it doesn't always work. When I tried to open some MacWrite files in Word 5.1, I had no luck. The files also wouldn't open when I dragged them onto the TeachText icon. What's the secret to effective dragging-and-dropping?

Barbara Zukin Heiman
Sonoma, CA

Bob: What a wonderful thing drag-and-drop launching is — you just drag the file you want to open onto the icon of the program you want to launch it with — but you've discovered that it has limitations. Some files can't be drag-launched even though they can be opened from within a program if you use the Open command. Microsoft Word is a good example — it can open MacWrite files if you use the Open command, but it can't drag-launch them. It's the same for PICT and Excel files — Word can open them from within the program, but it cannot drag-launch them.

TeachText is a somewhat different case. It can open only two types of files — text and PICT — so those are the only two file types it can drag-launch. Your MacWrite files are neither text nor PICT.

If you want these MacWrite files to drag-launch into Word or TeachText, save them as text-only (sometimes called text or ASCII text). You'll lose all of your formatting — fonts, margin settings, and so on — but the text files will open when you drag their icons onto Word or TeachText application icons. (However, it's probably preferable to just use Word's Open command for MacWrite files.)

Lots of Lexicons

Q. I have begun to accumulate a lot of software, each of which has its own dictionary. I now have dictionaries for WordPerfect 2.1, Excel, MORE, Word, and probably others I'm not even aware of. Is there any way to avoid duplicate dictionaries? This is particularly key for me because I'm in the medical field and accumulate words a lot of dictionaries don't have (try finding *myelophthisic* in your word processor's dictionary).

Chris Desch
via CompuServe

Bob: Have I got a program for you. It's called Thunder 7 ($99.95), from Baseline Publishing (901-682-9676). Thunder 7 is unquestionably one of the handiest utilities I own. It combines a dictionary with a spelling checker, thesaurus, and glossary and works beautifully with most applications, including WordPerfect 2.1, Excel, MORE, Word, and CompuServe Navigator (see Figure 2). You can add an unlimited number of words to the dictionary, and medical, legal, and scientific dictionaries are $19.95 each.

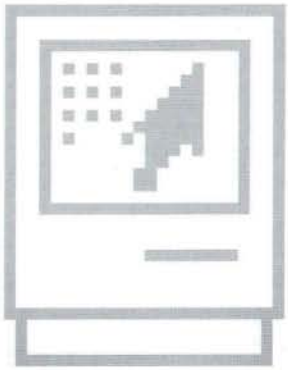

Figure 3: If you're left-handed, you probably know all too well that the arrow cursor points to the left. But southpaws can change it to a right-pointing arrow with the freeware Lefty extension.

Thunder 7 can check your spelling interactively (by beeping when you misspell a word) or in batch mode, checking the current selection or the entire document. I've tried many spelling checkers and thesauri, but this is the one I use every day (it's checking my spelling now as I type). It's one of the few utilities I find indispensable.

[*Another option is to use Spelling Coach Professional ($199), from Deneba (305-596-5644). It works much like Thunder 7 does (although it doesn't have a glossary function), and it also includes medical, legal, and technical dictionaries. — Ed.*]

Left-Handers Left Out?

Q. Why does the Mac's arrow cursor point to the left? Being right-handed, I don't mind it, but my sister who is a lefty commented to me that it would be nice if the arrow were to point to the right. She said that this was another drawback of being a southpaw in a right-handed world.

James E. Rodriguez
West Covina, CA

Bob: It doesn't have to be that way, James. Try Lefty, a small freeware extension written by Mike Stith. Just toss it into your System Folder and reboot to make your arrow cursor point to the upper right, (see Figure 3). Your sister will love it. You'll find it in the usual sources for freeware and shareware: on-line services (such as CompuServe and America Online) and user groups.

Andy: A far more lucrative course of action would be to contact one of those 1-800 personal-injury lawyers who advertise on late-night TV and sue Apple for violating the Citizens with Disabilities Act. (OK, left-handedness isn't an actual disability, but even so, your sister might cop a juicy settlement.)

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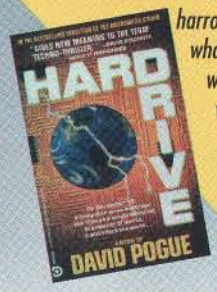

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Mechanism is Epson Magneto-Optical OMD-5010

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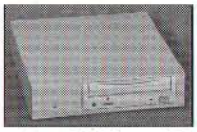

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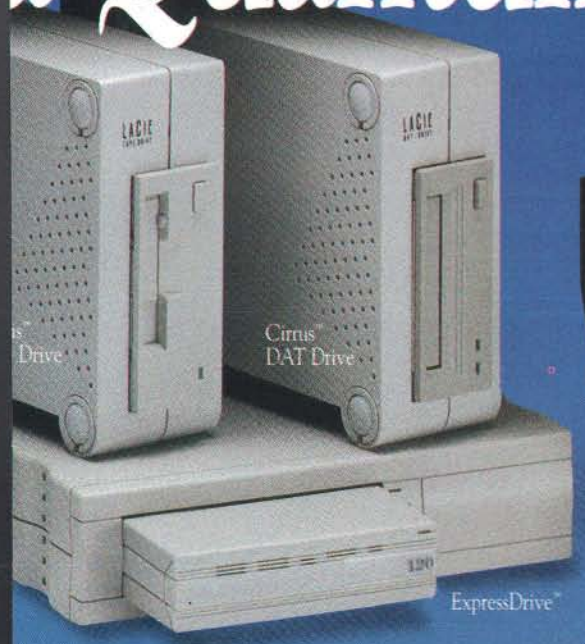

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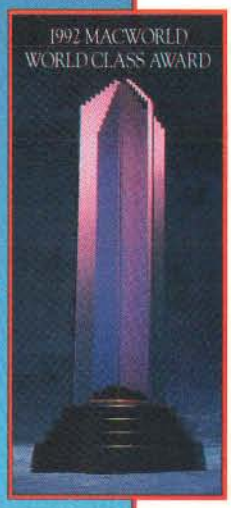

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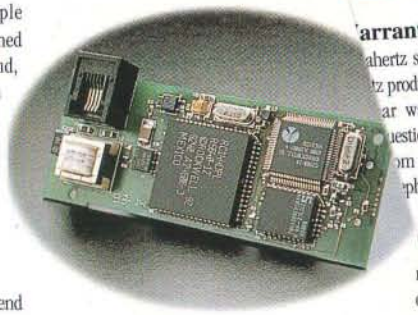

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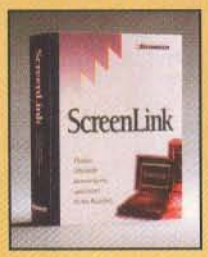

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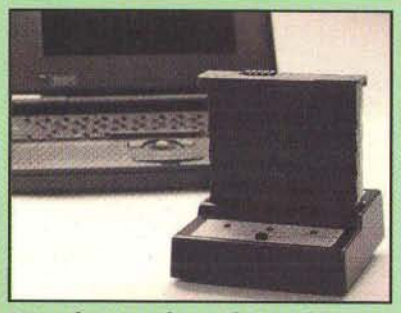

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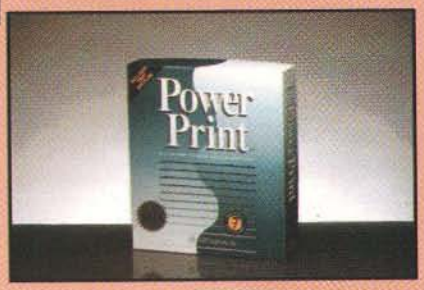

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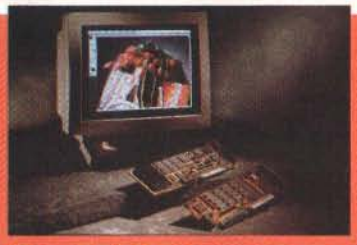

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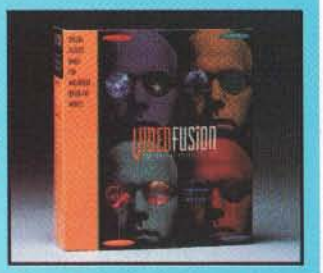

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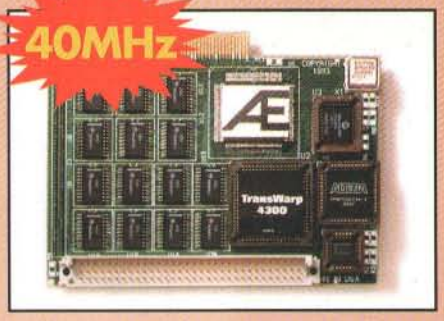

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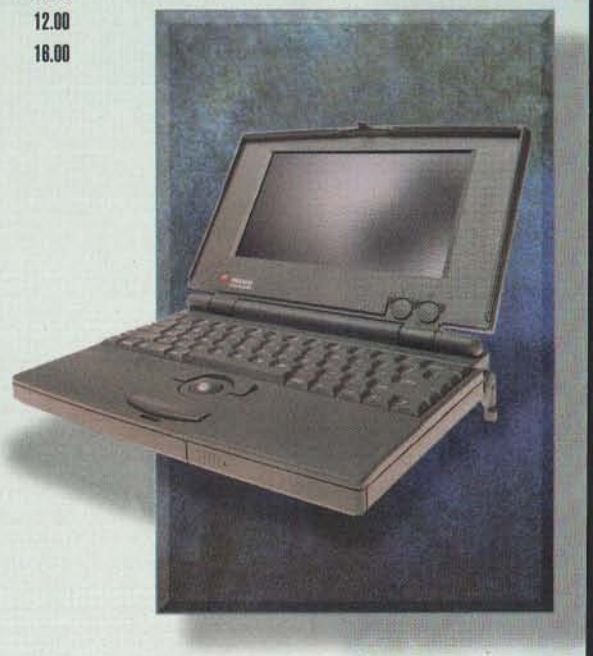

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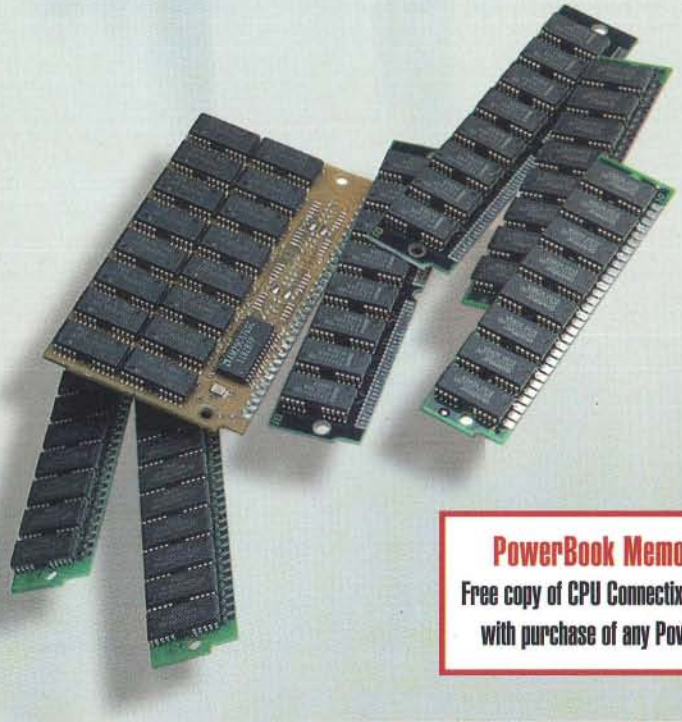

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MacUser August 1993

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Quantum

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1352MB	ST41600N/12MS	$1735	$1925
1415MB	ST41650N/15MS	$1689	$1869
1900MB	ST42100N/13MS	$1649	$1799
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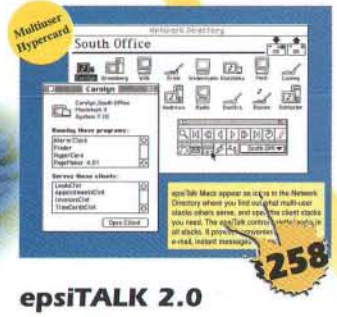

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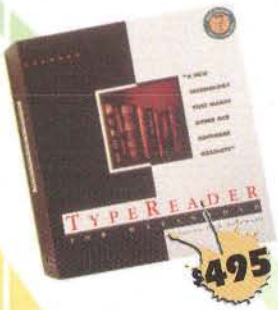

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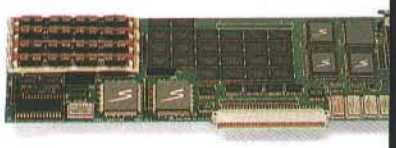

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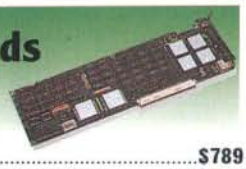

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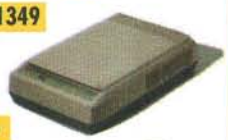

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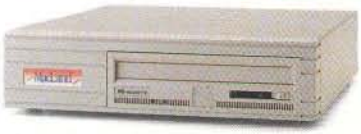

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SuperMatch 17-T $1069
Full-page, 17-inch Trinitron display

Spectrum/24 PDQ Plus $1499
Accelerated 24-bit color interface for 21" display

PhotoSpeed / Pro ..... $2999 / $3799
Photo CD compatible accelerated QuickDraw
Photo CD compatible accelerated QuickDraw & 24-bit color interface

Platinum 20 / 21 Two-Page ..... $869 / $1025
Two-page, 20-inch / 21-inch gray-scale display

PaintBoard Li $789
Accelerated 24-bit color interface for up to 20" displays

ProColor 32 ..... $2995
32-bit True-Color interface

PhotoPro $749
RISC adapter accelerates PhotoShop functions

24Sx / 24Mx / 24MxQ ..... $605/$1135/$1135
Accelerated 24-bit color interface for 13" / 16" with Mac II / 21" with Quadra

24STV / 24XLTV ..... $755 / $2548
Accelerated 24-bit color for 13", video display/capture
Accelerated 24-bit color, video display/capture

8XLi / 24XLi ..... $899 / $1359
Accelerated 8-bit color interface, upgradeable to 24-bit
Accelerated 24-bit upgraded color interface

New! Paintboard Turbo $1149
24-bit accelerated color interface with pan & zoom

CorrectColor Calibrator $1815
Calibrates displays with interface cards

21" Color Display $2569
Two-page, 21-inch color display

20" Multi-Scan Trinitron $2549
Two-page, 20-inch Trinitron display

20" Multimode Hitachi $1249
Two-page, 20-inch Hitachi display

CorrectPrint 300i $7499
Dye sublimation printer offers 300 dpi output

Rocket 040 33 ..... $1449
33MHz 68040 accelerator

Rocket 040 25i $955
25MHz 68040 accelerator

Rocket Share $399
Allows multi-processing with one or more Radius Rocket

VideoVision $1899
Color interface with video capture

Precision Color 24xp $475
Accelerated 24-bit interface for 16" displays

Precision Color 24xk $789
Accelerated 24-bit interface for 20" displays

Precision Color 24x $1489
Accelerated 24-bit interface for 21" display

PrecisionColor 8xj $479
Accelerated 8-bit color interface, upgradeable

Precision Color Display 20i $2569
Two-page, 20-inch color display

Full Page Display 15" $449
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Precision Color Pivot $915
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Monochrome Two-Page Display 21" $809
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MS Word 5.1 $269

MS Excel 4.0 $289

Quark XPress $499

Morph $81

EFI Cachet 1.1 $399

Infini-D $689

Displays

Bundle - 20" Color Display w/ 8-bit Card	$1739
Bundle - 20" Color Display w/ 24-bit Card	$2099
Apple 14" / 16" RGB Display	$515 / $1199
NEC MultiSync 4FG / 6FG	$755 / $2375
Sigma Designs Ergo View 17"	$1249
Sigma Designs Power Portrait	$599

Printers

Apple StyleWriter II	$329
Apple LaserWriter Select 300	$785
Apple LaserWriter Select 310	$1025
Apple Personal LaserWriter NTR	$1125
Apple LaserWriter Pro 600 / 630	$1849 / $2375
DECLaser 1152 with Toner	$999
GCC BLP Elite	$989
GCC PLP II / IIs	$699 / $949
Hewlett Packard LaserJet 4M	$1989
Tektronix Color Quick InkJet	$1651

Accelerators and Cache

AE QuickSilver IIsi with FPU	$245
AE TransWarp LC 33MHz with FPU	$895
LogiCache 50MHz w/ 68882	$775
LogiCache IIci 64K	$169
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Fujitsu 1.2GB/2.4GB	$1099 / $2399
NEC CDR-37 / CDR-74 CD-ROM	$406/$849
Quantum 127MB /240MB/525	$239 / $339 / $869
Go 80MB/120MB/160MB	$299 / $369 / $479
DEC 1GB 3.5" HH Drive	$1699
All Seagate Drives	Call
Toshiba 213 PowerBook	$599
Magic CD-ROM	$569

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Dayna EtherPrint / Plus	$326/$425

Dataproducts LZR 960 Printer $1079

Dataproducts LZR 1560 Printer $2929

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Farallon Timbuktu Remote Access Pack	$849
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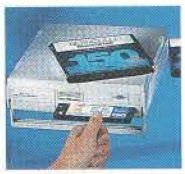
RapidTrak

The inexpensive software solution to a nagging hardware problem: slow data access. The concept is simple and effective — RapidTrak uses RAM to improve the responsiveness of any drive. It increases data access speeds by up to 200% and works with both hard disk drives and removable cartridge drives. Supports System 6 and 7.

BGD2769 **RapidTrak** **$59.95**



Mac Transportable MultiDisk 150

Bernoulli has broken the portable hard disk barrier with its unprecedented 150MB removable drive. It features fast, 18ms access times and up to 40MBits per second transfer rates. Reads and writes 150MB and 90MB disks, plus reads 44MB disks for backwards compatibility. Has a convenient built-in carrying handle.

BGD2630B **MultiDisk 150** **$799.90**

Mac Floptical 21MB External

The new 21MB Floptical drive from Iomega is truly the next generation in floppy disk drives. This drive is SuperDrive compatible, so you get SuperDrive capabilities and a second generation Floptical drive all in one. Plus, Iomega's Floptical drives are up to three times faster than standard floppy drives.

BGD2635B **21MB Floptical w/5 disks** ... **$499.90**

Meeting Maker

Meeting Maker is the new software for Macintosh networks that lets your whole organization plan and confirm meetings in a fraction of the time — even with people who are out of the office. It automatically compares people's schedules to help pinpoint the ideal time. Sends out invitations, tracks responses and erases cancelled or rescheduled meetings from calendars — automatically.

BGD2713 **Meeting Maker** 5-User **$199.90**

AXiON 3-Port Serial Switch

Just plug the new AXiON switch into your modem port and you can quickly and inexpensively switch between three serial devices — printers, modems — anything. Works with most Mac-compatible serial devices and supports any Mac.

BGD2898 **AXiON Switch** **$99.90**

Mac DisplayLink

The Mac DisplayLink converts RGB (from your Mac display) to NTSC (TV standard) supporting composite and high resolution S-Video. It reproduces all Mac-generated colors, from grayscale to millions of colors. Designed to be self-contained, Mac DisplayLink includes everything you'll need: cables, AC adapter, user's guide and book of presentation tips.

BGD D01-1120 **DisplayLink** **$389.00**

JetFill Refill Kits

Now you can refill your inkjet cartridges instead of buying new ones — just inject and squeeze. These fast-drying, water-resistant and smudge-proof inks give you great output every time. Available in black, red, blue, green and brown.

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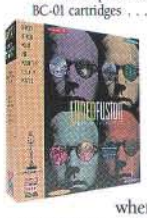
HP Deskjet/Plus/500, DeskWriter & 500C/550C (black only) and any printer or fax using HP 51608A cartridges **$49.95**

BGD8533B **HP DeskWriter/DeskJet (high capacity)**
Same as above, but for use with HP 5162A cartridges **79.95**

BGD8533C **StyleWriter I/II & Cannon BJ-10e/BJ-200**
Apple StyleWriter I/II, Cannon BJ-10e/BJ-10ex, Cannon Faxphone and others that use Canon BC-01 cartridges **$49.95**



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BGD2895 **VideoFusion** **$399.90**

Pax Imperia

A massive hit! A fascinating interactive, multimedia adventure where you control every aspect of a star-spanning empire. Economy, research, defense, espionage, exploration and diplomacy are your tools. You decide, along with a cabinet of six advisors, how to use your resources to expand your empire.

BGD C05-1000 **Pax Imperia** **$39.90**

PowerBook Wetsuit

Stop taking chances with your PowerBook — protect it with the PowerBook Wetsuit. This neoprene and nylon stretch suit will protect your PowerBook from scratches, scrapes and spills. It's the "protective stretch suit that always stays on even while you work." Comes with FREE PowerBook Palm Pads.

BGD S02-1101 **Wetsuit Bundle** **$39.90**

Star Trek Mousepads

Three of the hottest computer accessories of the year! The line of Star Trek The Next Generation mousepads is beautifully designed — the perfect addition to your desk.

BGD6093A **The Enterprise Mousepad** **$14.95**
BGD6093B **The Crew Mousepad** **$14.95**
BGD6093C **Planetary Explosion Mousepad** **$14.95**

SoftPC Windows

SoftPC Windows comes with Microsoft Windows 3.1 and MS-DOS 5.0 pre-installed. Run Microsoft Windows programs on any high-performance Mac. Emulates 256 colors and increased monitor resolution. Supports extended and expanded memory.

BGD2924 **SoftPC Windows** **$299.95**

SoftNode

Using SoftNode, SoftPC (Windows, Universal or Professional) runs PC applications written to run over Novell's NetWare for the PC. Your Mac can actually participate as a peer — with PCs — over a NetWare Network!

BGD2050 **SoftNode** **$99.95**

AccuZip6

AccuZip6 reduces your mail cost by 50% with features that include: Address Correction; ZIP+4 and CRRT Coding; Delivery Point Barcode Printing; Importing & Exporting; Find Duplicates; Presorting 1st, 2nd, 3rd Class; Avery Label templates; Integrated Word Processor; Custom Label and Report Designer and much more.

BGD2704 **AccuZip6** (after $200 Rebate) .. **$495.00**

Help!

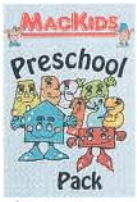
Help! is a remarkable software program that uses artificial intelligence to track down system problems and provide you with simple instructions on how to quickly resolve them. Help! includes the largest single source of Macintosh problem information available, with built-in knowledge on over 6,300 Macintosh software and hardware products.

BGD T01-1939 **Help!** **$79.90**

Vomax 2000

Vomax 2000 combines an advanced send and receive fax with powerful data modem capabilities. Answers voice/fax/data calls from a single analog phone line. Fully expandable and upgradable with three expansion ports and a memory expansion port.

BGD V01-1000 **Vomax 2000/Mac** **$379.90**



MacKids Preschool Pack

This title, for ages 3-6, will delight your preschooler or first-grader with six colorful activities designed to encourage the development of counting, the alphabet, shape and pattern recognition, simple math and short-term memory development.

BGD N11-111 **Preschool Pack** **$33.90**

MidiSchool

MIDI — now there's a fast, fun way to understand the basics, build on the fundamentals and use the built-in 8-track sequencer to record your songs. MidiSchool explains the world of MIDI, through the use of text and graphics and offers interactive lessons on electronic music.

BGD E02-1112 **MidiSchool** **$59.90**

SoftPC Universal

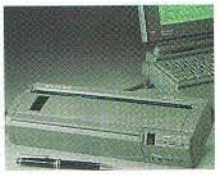
Includes MS-DOS 5.0 and Microsoft CD-ROM extensions pre-installed. Run thousands of PC programs on any Mac. Emulates 16-color EGA graphics and emulates an 80286 processor in real mode, as well as an 80287 math coprocessor for faster calculations.

BGD2917A **SoftPC Universal 3.0** **$99.95**

SoftPC Professional

All the same functionality of SoftPC Universal with the ability to actually run VGA graphics PC applications on any high-performance Mac. Emulates VGA graphics with 256 colors and increased monitor resolution.

BGD2926 **SoftPC Professional** **$199.95**



WriteMove II

WriteMove II is the most convenient, highest quality, portable printer for the PowerBook available, powering out an impressive 360 dpi output for laser quality documents. Features background printing, on-screen preview, color/grayscale printing, ATM and True Type Support, and 21 Adobe Type 1 fonts.

BGD2035 **WriteMoveII** **$499.90**

Insanity

Your mouse becomes a trigger for the weapon of your choice — and your frustration — with Insanity... the ultimate tension reliever for your Mac — and you. Don't take vengeance into your own hands, let Insanity do it for you. And when you come back to your senses, one stroke of the return key restores the screen to its original state.

BGD U11-1111 **Insanity** **$19.90**

PixelPlay

PixelPlay turns QuickTime movies into screen savers. With Apple's new QuickTime technology, PixelPlay gives you a fast, easy and creative way to explore the world of digital movies — while your screen sleeps. Includes a copy of QuickTime, a collection of action-packed movies, and a module for Berkeley Systems' After Dark Screen Saver that turns this popular program into your own digital movie channel.

BGD S02-1104 **PixelPlay** **$37.90**

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The simplest, easiest, best-priced Electronic Mail program is now available. You can send messages and documents of any size to one or more people — and never leave your desk! Almost no training required. Just load SnapMAIL and let the staff go to it! No product administrator or maintenance necessary — this product runs itself. User friendly, office friendly — that's SnapMAIL.

BGD S05-1005 **SnapMAIL** 5-User **$124.90**
BGD S05-1010 **SnapMAIL** 10-User **$198.90**
BGD S05-1050 **SnapMAIL** 50-User **$898.90**

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Optional Resolution (dpi)	800 x 800, 960 x 960 & 1200 x 1200	None	600 x 1200	None
Standard RAM	12 MB	12 MB	12 MB	4 MB
Virtual Disk Technology	✓ †			
Enhanced Gray Scale	✓			
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† Optional Statistics as of 3/93

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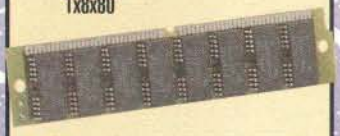

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Virtual 3.0	139
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Quadra Video RAM (256K-80ns)	31
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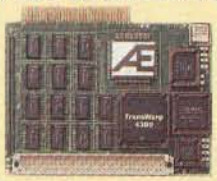

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(#6550, Leader Technologies/Targus)

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.4, 2MB RAM under System 7.

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Minimum requirements: NuBus-based Mac II, 2MB RAM, System 6.0.7, a hard drive, RocketShare for Duo or IIfx.

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Minimum requirements: Mac Plus, 1MB RAM, System 6.0.5, a hard drive. (Aldus recommends 2MB RAM)

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(#5657/5355, Fractal Design/ Wacom Technology Corp.)

Minimum requirements: SE 30, 2.5MB RAM, System 6.0.5.

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PANTONE Process Color System Guide 1000

$58.

PANTONE Process Color Image Guide

The PANTONE Process Color Imaging Guide 1000 is the perfect companion to all PANTONE-licensed software programs. It provides a visual comparison of 942 solid PANTONE Colors and process simulations as they would appear on the final printed piece. (#5160) When you need a much broader selection of process colors, turn to the PANTONE Process Color System Guide. This fan-out process color selector provides users with a visual color standard and screen percentage values for over 3,000 new CMYK combination, which are easily created, specified, and reproduced with your favorite graphics program. (#5159, PANTONE)

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DeBabelizer

This graphics processing toolbox will save you lots of time, effort, and money. It translates from and to over 50 bit-mapped graphic file and animation formats for Mac, DOS, Windows, Silicon Graphics, Sun Microsystems, Amiga, and others. You can even edit images without the creating software. Batch processing and internal scripting functions save time by automating repetitive manipulation and editing tasks. Create QuickTime blue-screen effects with background removal features. DeBabelizer will also report and display differences between original and revised images. Jack Eastman, VP Engineering of Berkeley Systems (makers of After Dark) says, "DeBabelizer has the best cross platform graphics translation for serious graphics production. We couldn't product our graphics without it."
(#6193, Equilibrium)

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.7.

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Minimum requirements: Mac Plus, 2MB, System 6.0.5.

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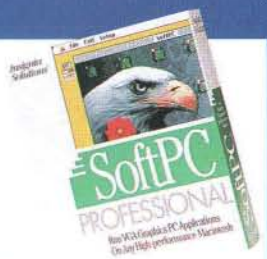

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Minimum requirements: SE/30, 8MB RAM, System 6.0, 6MB hard drive space.

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Minimum requirements: Mac Plus, System 6.0, 2MB RAM and System 6.0.2 for Action!

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Minimum requirements: Mac Plus, 2MB RAM, System 6.0.4.

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Retrospect Remote is centralized backup and archive software for Macintosh networks. Complete automation allows for daily, unattended backup of ten Macs to a single storage device. (#6050, Dantz Development)

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.5, a hard disk, 4MB RAM under System 7.

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The Infinity 105 is the smallest and fastest removable SyQuest drive available. It provides sustained data transfer rates of up to 1.75MB/sec. and access time of 14 ms. It allows you unlimited storage capabilities by simply adding additional 105MB 3.5" cartridges. The Infinity 105 is an ideal storage device for animators, on-line editors, and users of interactive multimedia who need to take their shows on the road. It's about the size of a paperback novel so it's a perfect portable storage solution. And it can also be daisy-chained to other devices for desktop use with an external power supply. (#6255, PLI)

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(#6456, Apple Computer)

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Minimum requirements: Mac Plus, 2MB RAM, System 6.0.5, a hard drive.

$48.

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Get fast-reaction control and the ultimate in realism for flight simulators and your favorite Macintosh games with the MacFLY Joystick. Customize the settings to your tastes with the included software. Two independent fire buttons with two modes provide double the functions. Your mouse stays active when you use the MacFLY; just move either device to automatically switch control. (#6458, IZU Products)

Minimum requirements: Mac SE, 1MB RAM, System 6.0.4.

$338.

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Symantec C++ for Macintosh combines the speed of a fast native C++ compiler with the speed and functionality of the THINK development environment. C++ provides an object-oriented approach for faster and easier-to-code development. The THINK Class Library gives you an application framework with all the C++ building blocks you need to write Mac applications. (#6488, Symantec)

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.5, a hard drive.

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Minimum requirements: Mac Plus, 1MB RAM, System 6.0.4.

$224. cc:Mail Remote (#6037)

$348.

Yamaha HELLO! MUSIC!

The HELLO! MUSIC! system includes the Yamaha CBX-T3 Tone Generator and easy-to-use "MIDI Player" software. It's fully "General MIDI" compatible, so the world of pre-programmed MIDI music is at your fingertips. If you're a musician, the CBX-T3 can act as your computer's MIDI interface. And you get Passport's Trax, **FREE**. Enter music into Trax by playing your MIDI instrument live or one note at a time, or you can even enter individual notes on screen with your mouse. You also get 192 16-bit samples of CD-quality sound. An audio input terminal lets you mix in material from any audio device for custom sampling. The CBX-T3 plugs into the serial port on your Mac or PC. (#6546, Yamaha)

Minimum requirements: 4MB RAM under System 7.

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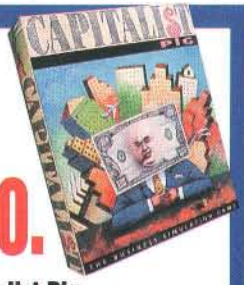

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120mb	17ms	$319	$419
160mb	17ms	$459	$559

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3.5" LOW PROFILE

Capacity	Access	Internal	External
120mb	10ms	$269	$329
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525mb	10ms	$829	$889

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Capacity	Access	Internal	External
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127mb	17ms	$215	$275
170mb	17ms	$239	$299

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3.5" HALF HEIGHT

Capacity	Access	Internal	External
425mb	9ms	$685	$735
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TWO YEAR WARRANTY

Unformatted Capacity	Model	Access Time	Actual MAC Capacity	Internal	External
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212mb	7213S	15ms	202mb	$279	$339
240mb	7245S	15ms	235mb	$309	$369
540mb	MXT-540	8.5ms	521mb	$899	$959
LXT & MXT Series (3.5" Half Height)					
340mb	LXT-340	15ms	324mb	$499	$559
1240mb	MXT-1240	8.5ms	1150mb	$1329	$1389

Seagate

NEW 3.5" HALF HT 2.4 GIG

Unformatted Capacity	Model		Access Time	Actual MAC Capacity	Internal	External
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1.2GIG	ST11200N		10.5ms	1000mb	$1125	$1185
2.4GIG	ST12400N		9ms	2000mb	$2195	$2255
5.25" FULL HEIGHT						
1.6GIG	ST41651N	Wren-8	15ms	1350mb	$1349	$1449
2.1GIG	ST42100N	Wren-9	12.9ms	1900mb	$1725	$1825
1.6GIG	ST41600N	Elite-1	11.5ms	1307mb	$1799	$1899
2.4GIG	ST42400N	Elite-2	11ms	2050mb	$2329	$2429
3.4GIG	ST43400N	Elite-3	11ms	2750mb	$2949	$3049

Seagate drives carry a ONE Year Warranty.

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CMO-OMD5010	Epson	128mb	3.5" Half Height	45ms	$939	$969
CMO-JY750	Sharp	594/652mb	5.25" Half Height	40ms	$2069	$2099
CMO-5031E	Ricoh	594/652mb	5.25" Full Height	28ms		$2295
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2.0GIG	WangDAT 3100	DAT, DDS	$1045	$1065
3-5GIG	WangDAT 3200	DAT, DDS-DC	$1279	$1299
2.0GIG	HP 35470A	DAT, DDS	$1209	$1229
3-5GIG	HP 35480A	DAT, DDS-DC	$1349	$1369
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ThunderLight $1669
Spectrum/24 PDQ+ / Series IV ..... $1459 / 795
Futura SX / MX / LX ..... $469 / 819 / 1039

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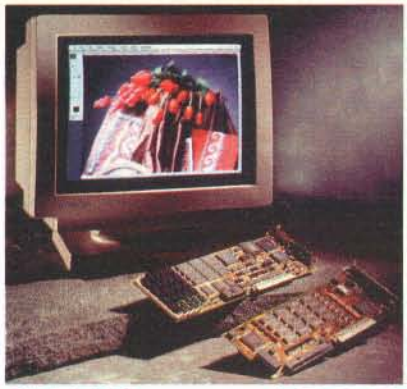

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* Comp w/ Classic, SE, LC, SE/30, II, IIx, IIcx, IIsi, IIci, Performa, PowerCache Adapter not included

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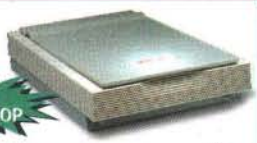

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CIRCLE 55 ON READER SERVICE CARD.

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Our high capacity Spin Drives come with speed-demonesque mechanisms from DEC, Seagate and Fujitsu. Check the chart at the right for blazing access times, and throughput rates. Available in Internal, Zero Footprint and Compact enclosures. (Compact pictured)

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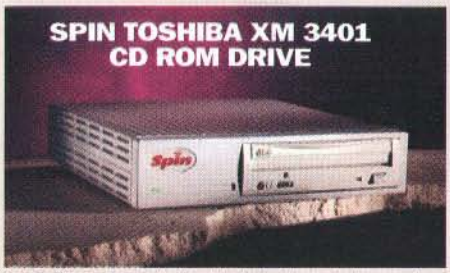
SPIN TOSHIBA XM 3401 CD ROM DRIVE



The Toshiba mechanism in this drive is double speed – in a word, whoosh, making the Spin CD ROM perfect for Photo CDs and MultiSession applications.

Toshiba Double Speed CD ROM Drive	$549.00
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Small footprint. Small pricetag: under $1000. It accepts ISO standard 128 MB capacity 3.5-inch cartridges compatible with other machines. Exclusive 2-yr warranty.

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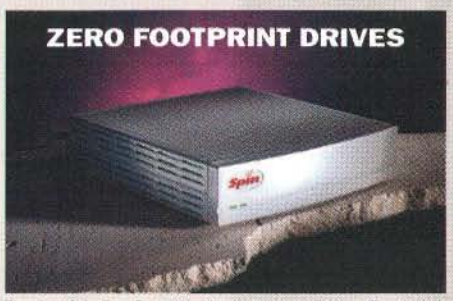

There's a Spin Zero Footprint drive for every application. They include everything you need to get up and running. Check this chart for specs and prices.

Capacity (MB)	Model Number	Av. Acc. Time (msec)	Transfer rate (K/sec)	MFG warrty. (mos)	Int. Drive Price	Zero FP Drive Price	Compact Drive Price
Conner							
85	CP-30080E	16	1300	24	$199	$259	
120	CP-30100	16	1300	24	$259	$309	
170	CP-30170E	16	1400	24	$269	$329	
213	CP-30200	15	2000	24	$349	$399	
Quantum							
85	ELS 85S	17	1800	24	$179	$249	
127	ELS 127S	17	1800	24	$199	$279	
170	ELS 170S	17	2000	24	$219	$299	
240	LPS 240	16	2300	24	$299	$389	
120 (Pwrbk)	GO 120	17	1900	12	$299		
Digital							
1.05GB	DSP-3105	9.5	2600	60	$1,249	$1,299	$1,349
Seagate							
1.05GB	ST-11200N	10.5	3200	60	$999	$1,049	$1,099
Fujitsu							
520MB	M2624ESA	9	2700	60	$799	$859	$899
1.06GB	M2694FA	9	2800	60	$1,399	$1,449	$1,499
Toshiba							
210 (pwrbk)	MK-224	12	1800	12	$499		

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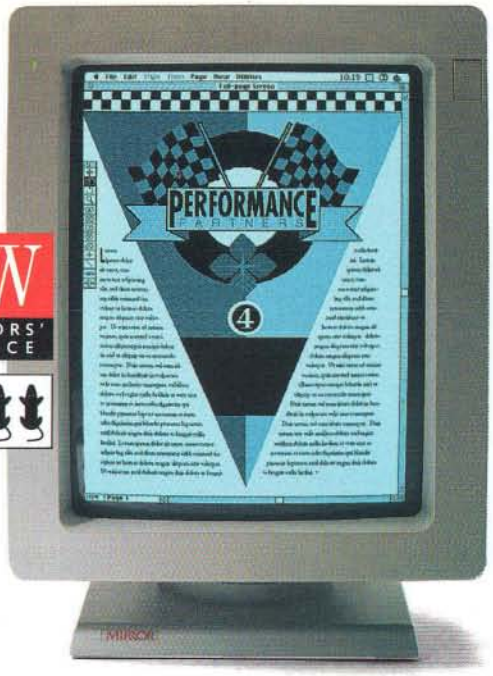
CIRCLE 30 ON READER SERVICE CARD.

MacUser and MacWorld agree, Mirror displays are the best value. Against tough competition, our Full-page display garnered Editor's Choice and 4 Mice, while our Two-page display was awarded 4½ Mice.

MW EDITORS' CHOICE

Number 1 in Customer Loyalty

Equally important is the feedback we get from our customers. A recent independent survey of monochrome monitor owners ranked Mirror #1 in customer loyalty (beating out Radius, SuperMac and RasterOps).



"Our panel of editors judged the Mirror monitor to be the best, with sharp focus over the entire screen ...an excellent value."
Macworld, May 1993

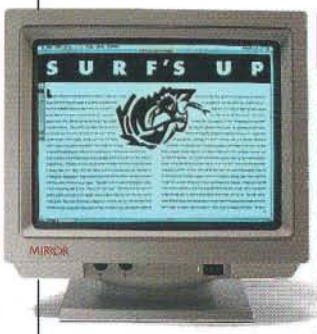
$399

No Dealer Mark-up

It's one thing to design a product every bit as good as Radius and SuperMac (who we think set the standards for great displays). But delivering them without dealer mark-up at savings of up to 40% makes them unquestionably the best value on the market.

*All Mirror products come with lifetime technical support and the confidence that comes from dealing with a company that's been in the Macintosh business since 1985. Backed by our risk-free 30-day "love it or return it" satisfaction guarantee.**

EDITORS' CHOICE!



Thousands of satisfied customers have discovered our 19" PixelView Two display. With our risk-free satisfaction guarantee, you can too.

$799
with video card.

See the Future

The PixelView Two-Page Display lets you view 12 months of your budget or both pages of your newsletter layout. It features 72 dpi resolution—a must for desktop publishers.

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Exclusive Desktop Designer Software

Our exclusive Desktop Designer software allows you to use the built-in screen on a Classic, SE, or SE/30 as an extension of the large screen, giving you even more workspace. And adds productivity enhancements like pop-up menus, enlarged cursor and a screen saver.

Need Color?
Call about our ProView color displays.

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CIRCLE 118 ON READER SERVICE CARD.

BREAK THE BOUNDARIES.

DGR 256REM - 1993 MacUser Bottom Line Picks
DGR 128REM - 1992 MacUser Bottom Line Picks
SETTING THE STANDARD FOR EXCELLENCE

MacUser LABS Bottom Line Pick

▶ 128REM Turbo Fujitsu
3.5" Magneto-Optical
768 Kb/s Transfer Rate
30 ms Average Seek Time
1 5 ms Short Seek Time

▶ 128REM Turbo Epson
3.5" Magneto-Optical
768 Kb/s Transfer Rate
34 ms Average Seek Time
< 1 ms Short Seek Time

▶ 128REM Sony
3.5" Magneto-Optical
625 Kb/s Transfer Rate
< 40 ms Average Seek Time
< 1 ms Short Seek Time

▶ 256REM MOST
3.5" Magneto-Optical
1.23 Mb/s Transfer Rate
35 ms Average Seek Time
1 2 ms Short Seek Time
"The DGR 256REM was not only the fastest drive we tested, but it can also store 256 megabytes of data on a single cartridge - and it is able to read from and write to128-megabyte cartridges."
MacUser Labs, April 1993

▶ NEW! 650MB Sony
5.25" Magneto-Optical
680 Kb/s Transfer Rate
70 ms Average Seek Time
2 2 ms Short Seek Time
WORM Compatible

▶ Ready to Use
All DGR optical drives come complete with a cartridge, cabling and driver software

CIRCLE 175
ON READER SERVICE CARD.

DB38

In July 1992, MacUser Labs tested every 3.5-inch optical drive on the market, and chose the DGR 128REM as MacUser Bottom Line Pick.

They were so impressed, in fact, that in 1993 they made DGR Technologies the standard of excellence by which all other drives were judged.

The result? Only more applause for DGR Technologies, the critical award winner year after year. And, more applause for optical technology, offering "virtually unlimited storage capacity." Without compromise. Because optical storage technology means the ultimate in high-capacity performance and reliability.

So break the boundaries.

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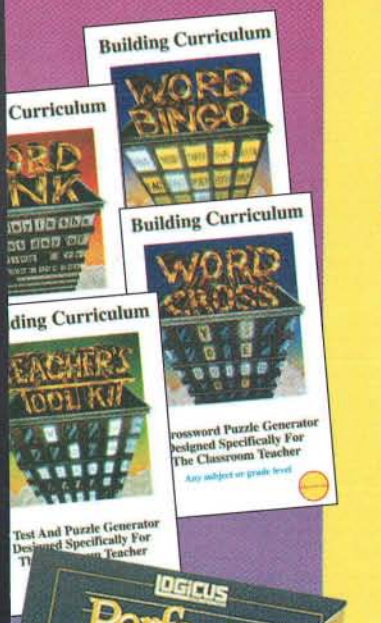

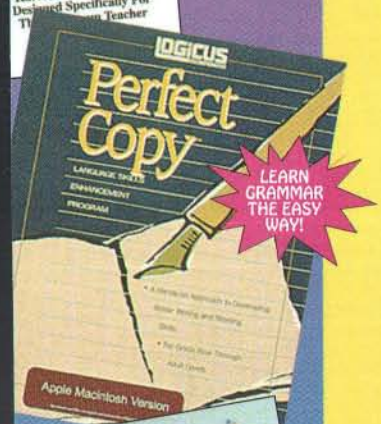

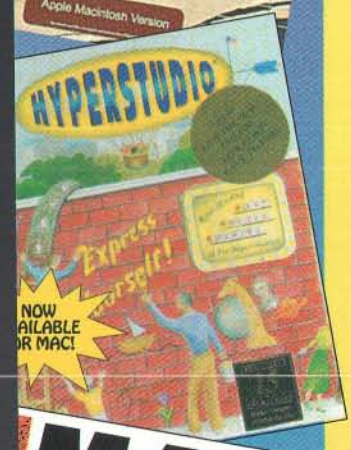

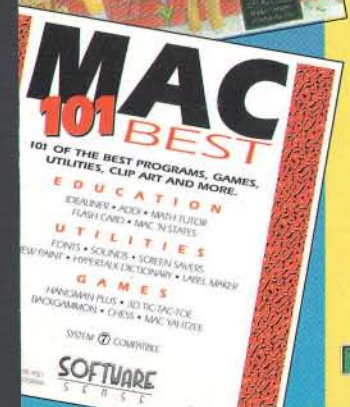

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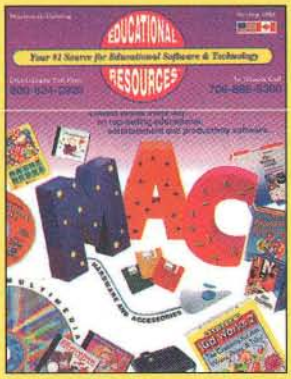

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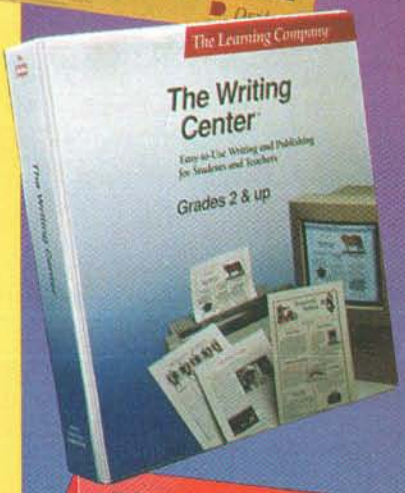

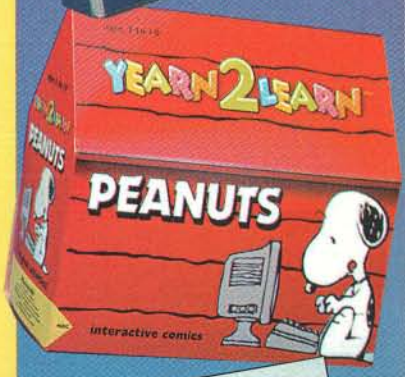

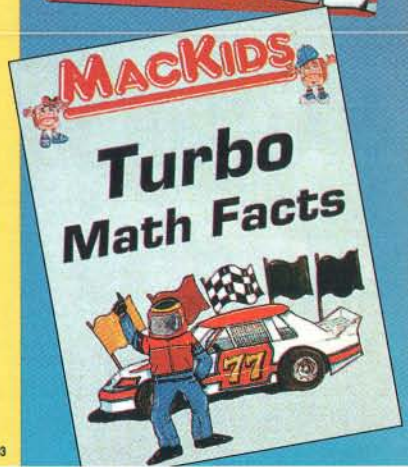

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AD ITEM #080193

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Réal Provencher
President

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When you order from us, you get computer experts, not clerks! All of our salespeople are trained in Apple's intensive program, as well as our own. On average, they have three years of Mac experience. They're ready to help you (with a smile!) both before and after the sale.

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Our tech team is well trained, well informed, and well known for their ability to solve customers' problems with a minimum of inconvenience to the customer. ***We have the best tech support team in the business.*** Call them toll-free at: 1-800-364-MACS. Please have your customer number ready.

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OUR FAMOUS GUARANTEE: ***If you don't like it, we'll buy it back.*** If you're not 100% satisfied, call for your RMA number and return the product within 30 days of the ship date. We'll cheerfully refund your purchase price. Guarantee applies to all hardware except leases, PowerBooks, consumables, and special-order items.

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All leases are subject to credit approval. All lease payments in our ads are based on the "True Lease" program at 48 months. Prices, lease prices, and rates are subject to change without notice.* ***NOTE: Minimum lease payment is $50 per month.*

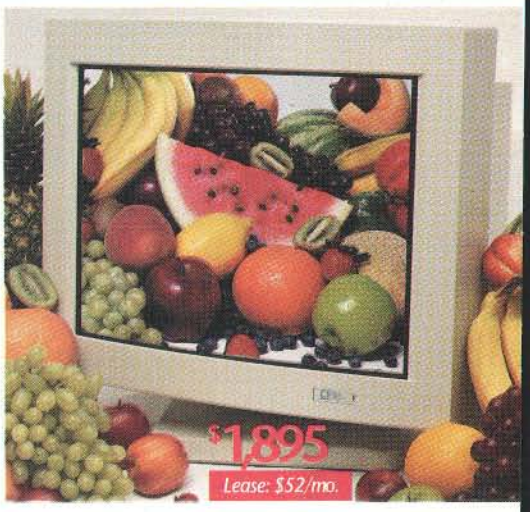
1-800-364-LESS

HARDWARE THAT FITS • 610 S. Frazier Conroe, TX 77301

HARDWARE THAT FITS

SUPERMAC

$2,699
Lease: $43/mo.



$1,895
Lease: $52/mo.

Monitors: all sizes, brands & prices

Need help choosing a monitor? Not sure if you need one that auto-syncs? Call our friendly sales team. They're happy to answer your questions.

	Price	Tube type	640 x 480	640 x 870	832 x 624	1024 x 768	1152 x 870	Auto-syncing	Anti-glare
A. Radius 21" Color	$2,399	Hitachi					■		■
NEC 21" 6FG Color	2,699	NEC	■		■	■	■	■	
SuperMac 21" Mono/Grayscale	1,069	—					■		■
B. SuperMatch 20•T Multi-Mode XL	$2,649	Trinitron				■	■		■
C. RasterOps 20" Trinitron Multi-Mode	2,359	Trinitron	■		■	■	■	■	■
* RealTech 20" Trinitron Multi-Mode	1,895	Trinitron	■		■	■	■	■	■
Radius IntelliColor 20"	2,759	Trinitron	■		■	■	■	■	■
RasterOps 20/20™ MultiScan	1,499	Shadow Mask	■		■	■	■	■	■
RasterOps 20" Hitachi Color	1,329	Hitachi	■		■	■		■	■
* SuperMac 20" (SuperMatch)	1,549	Hitachi				■			■
Mitsubishi 17" Diamond Pro	$1,199	Trinitron	■		■	■	■	■	■
NEC 17" 5FGe Color	1,299	NEC	■		■	■	■	■	
D. Sony 17" 1730	1,149	Trinitron	■		■	■		■	■
SuperMac 17" (Supermatch)	1,069	Hitachi	■		■	■		■	■
SuperMac 17" Trinitron	1,039	Trinitron	■		■	■		■	■
Seiko Instruments 17" CM1760LR	1,089	Trinitron	■		■	■		■	■
E. RasterOps 16" (RasterOps Sweet 16)	$1,199	Panasonic			■				■
E-Machines 16" Color (ColorPage T16)	1,299	Trinitron	■		■	■		■	■
NEC 15" 3FGe Color	$699	NEC	■		■	■		■	
NEC 15" 4FGe Color	889	NEC	■		■	■		■	
F. Radius 15" Precision Color Pivot	989	Proprietary	■	■	■	■		■	■
G. Sigma 15" Grayscale (PageView GS)	599	Phillips		■					■
H. RealTech 15" Grayscale	449	—		■					■
Sigma 15" Grayscale (Power Portrait)	659	Phillips		■					■
Seiko Instruments 14" Color (CM1445)	$479	Trinitron	■						■
Sony 1430	699	Trinitron	■						■

* shown above (italics indicates monitors not pictured)

Your Hardware That Fits partner will tell you which monitors are on-board compatible, and which ones require a card or cab

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Have your customer number ready. Call 1-800-364-MACS.

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B SUPERMAC

C RASTEROPS THE ART & SCIENCE OF COLOR

SONY

D

F radius

E RASTEROPS THE ART & SCIENCE OF COLOR

G SIGMA DESIGNS

H Real Tech

VIDEO CARDS

Don't know which card is compatible with your CPU & monitor? Call us toll-free.

E-Machines

ColorLink DC/T	$499
ColorLink SX/2	649
Futura SX24	479
DoubleColor LX (8)	649

SuperMac

Spectrum/24 PDQ Plus	$1519
Spectrum/8 NuBus	419
Spectrum/8LC II, IIsi	349
Spectrum/24 Series IV	829
Spectrum/8•24 PDQ	789
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RasterOps

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Radius

Precision Color 24X	$1549
Precision Color 8XJ	519
Precision Color 24XK	849
Precision Color 24XP	519
Video Vision*	1999

*24-bit; captures up to 30 frames/second

The photo above is a 300 dpi image of an 8 x 10 transparency. It was scanned on the RealTech Scan 800 with Transparency Option, then adjusted with ScanMatch and color-corrected with Adobe Photoshop.

MICROTEK

Scanmaker IIXE

$1,179

Lease: $33/mo.

Real Tech

Scan 800 with Transparency Option

$1,595

Lease: $44/mo.

Scanners

Flatbed desktop scanners for 24-bit color, 8-bit grayscale, and black/white images. Ideal for mid-range output or position prints for mockups/presentations.	Price	DPI	Brightness & contrast levels	Scanning area	Flat art	Transparencies	Slides	Software
MICROTEK								
Scanmaker II	$909	600	14	8.5 x 13.5	■			Includes limited version of Adobe Photoshop
Scanmaker IIXE	1,179	600	14	8.5 x 13.5	■			Includes full version of Adobe Photoshop
REALTECH								
Scan 800 Optional Adobe Photoshop	$1,099 200	800	200	8.5 x 11.75	■			Includes Scan-Match color calibration software
Scan 800 with Transparency Option	1,595	800	200	8.5 x 11.75	■	■	■	
UMAX								
UC 630	$1,119	600	51	8.5 x 14	■			Includes full version of Adobe Photoshop
Transparency Option	679	(600)	(51)	6 x 9	■	■	■	
UC 840	1,299	800	51	8.5 x 14	■			Includes full version of Adobe Photoshop
Transparency Option	679	(800)	(51)	6 x 9	■	■	■	

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Printers.

QMS 860 Hammerhead

TI MicroLaser XL Turbo

TEXAS INSTRUMENTS

TI MicroLaser Plus

Laser printers.

The right printer can do wonders for your productivity. Do you need speed? Adobe PostScript Level 2? Do you need to print a lot of pages each month?

	Dpi / Engine speed / RAM	Interpreter / Microprocessor	Duty cycle / Paper trays	SCSI port / Interfaces	Resident fonts / Misc.
LETTER-SIZE PRINTERS					
DEClaser 1152 $995 digital™ *Lease: $28/month*	■ 300 dpi ■ 4 pages/min. ■ 2 Mb RAM (expandable to 4 MB)	■ Adobe PostScript Level 2 ■ Motorola 68000 processor	■ 6,000 pages per month ■ Adjustable 70 sheet paper tray (optional 250 sheet paper tray)	■ No SCSI port ■ Appletalk RS-422, parallel, and RS-232C.	■ 17 (upgradable to 43 with a cartridge)
Texas Instruments MicroLaser Plus $1,099 *Lease: $30/month*	■ 300 dpi ■ 9 pages/min. ■ 1.5 Mb RAM (expandable to 4.5 MB)	■ Adobe PostScript Level 1 ■ Motorola 68000 processor	■ 10,000 pages per month ■ Optional 2nd paper drawer and envelope feeder	■ Optional SCSI port ■ Appletalk RS-422, parallel, and RS-232C	■ 17 *Available with 35 resident fonts ($1239)*
NEC Silentwriter Model 95 $1,469 *Lease: $40/month*	■ 300 dpi ■ 6 pages/min. ■ 2 Mb RAM (expandable to 5 MB)	■ Adobe PostScript Level 2 ■ Motorola 68000 processor	■ 6,000 pages per month ■ Built-in envelope feeder & 250-sheet tray; optional 2nd tray available in letter or legal sizes	■ No SCSI port ■ Appletalk RS-422, parallel, and RS-232C	■ 35 *Micro-fine toner and NEC's patented "Sharp Edge" technology create sharp black print quality*
NewGen PS 880p $2,119 *Lease: $58/month*	■ 800 dpi ■ 4 pages/min. ■ 12 Mb RAM (expandable to 32 MB)	■ PostScript ■ Weitek RISC processor	■ 8,000 pages per month ■ Built-in 70 sheet paper tray	■ Optional SCSI port ■ Appletalk RS-422, parallel, and RS-232C	■ 35 ■ Supports Adobe PostScript *NewGen's proprietary Image Enhancement Technology*
Texas Instruments MicroLaser XL Turbo $2,795 *Lease: $77/month*	■ 300 dpi ■ 16 pages/min. ■ 2.5 MB RAM (expandable to 10.5 MB)	■ Adobe PostScript Level 2 ■ Weitek RISC processor	■ 25,000 pages per month ■ Optional 2nd paper drawer	■ Optional SCSI port ■ Appletalk RS-422, parallel, and RS-232C	■ 35
TABLOID PRINTERS					
Compaq Page Marq 20 $3,995 *Lease: $111/month*	■ 400 dpi ■ 20 ppm (letter size) ■ 4 MB RAM (expandable to 20 MB)	■ Adobe PostScript Level 2 ■ 29000 RISC processor	■ 50,000 pages per month ■ 3 letter size twin trays ■ Optional 11 x 17 paper tray ($85)	■ Optional SCSI port ■ Optional Ethernet ■ Parallel, RS-232C, and optional Appletalk RS-422	■ 43 outline scalable fonts, 7 fixed fonts
QMS 860 Hammerhead $4,279 *Lease: $118/month*	■ 600 dpi ■ 8 ppm (letter size); 4.6 ppm (tabloid size) ■ 12 MB RAM (expandable to 32 MB)	■ Adobe PostScript compatible ■ Intel 80960CA RISC processor	■ 10,000 pages per month ■ Optional 2nd paper cassette	■ SCSI port ■ Optional Ethernet ■ Appletalk RS-422, parallel, and RS-232C	■ 39

More printers!

If you want a printer that's not listed in this ad, please call us toll-free.

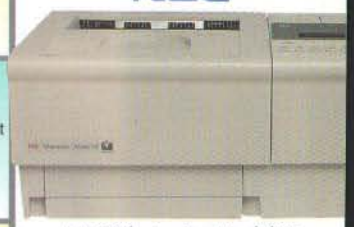
PORTABLE

Kodak Diconix 180si $289
Kodak Diconix 701 Inkjet 429

LETTER SIZE

Compaq Page Marq 15 .... $2795
NEC Silentwriter 95fx $1729
NEC Silentwriter 97 1769
NEC Silentwriter 97fx 2059
NewGen PS/660 2699
TI Turbo 1449

NEC



NEC Silentwriter Model 95

TABLOID SIZE

NewGen 660B w/Ethernet $4499
NewGen PS 660B $4059

COLOR

$5,995
Lease: $164/mo.

RasterOps 300i $6995
RealTech Color 350 5995
Seiko ColorPoint PSX 5599
Seiko PSE 2699
QMS 210 4599

QMS SII Seiko Instruments

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Systems, networking & more.

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25 MHz Turbo 040 ..... *$1099*
33 MHz Turbo 040 ..... *1349*
FastCache Turbo 040 ..... *179*
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Universal PowerCache Accelerators

Math chip available. Supports 16 platforms.

33 MHz Accelerator *$379*
40 MHz Accelerator *549*
50 MHz Accelerator *719*
PowerCache Adapter *40*

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Includes PicturePress 2.5, Charger Plug-ins, and Kodak Photo CD access with clip art images.

Charger *$799*

radius ROCKET™

For the Mac II family. Includes QuickDraw and display-list acceleration software.

Radius Rocket 25i *$1039*
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SCSI II Booster *249*
Rocket Share *419*
FastCache Turbo *179*

PLI Newer Technology Applied Engineering

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CAYMAN SYSTEMS Shiva Farallon

FastPath 5R Router/Gateway *$1669*
NetBridge *599*
EtherGate Router *1239*
NetSerial *269*
NetModem/E *1409*
NetModem v.32 (for LocalTalk) *989*
LanRover/L *579*
LanRover/E (4-port) *1659*
TeleBridge *599*

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Supports AppleTalk Phase 1 and 2 protocols; divides network into multiple zones.

Dayna EtherPrint *$335*
Dayna EtherPrint Plus *439*
Dayna EtherPrint 3 ..... *379*

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–*Bronze* *189*

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SupraFax Modems include STF and Microphone software, and are backed by a 5-year warranty.

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SupraFax 144 PB *299*
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Our three sales teams (one is shown here) are ready to help you with any question you might have.

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Lets you use inexpensive unshielded twisted-pair (UTP) telephone wire instead of expensive coaxial cable for local area networks.

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MacCon 3 Card (automatically configures to media used) *209*

DaynaPORT E/II-T NuBus Card

Connects Mac II computers to thick, thin, fiber optic or 10Base-T Ethernet cable systems. Includes an RJ-45 jack for 10Base-T wiring.

DaynaPORT E/II-T NuBus Card. *$149*

DaynaPort E/Z. Ideal for Macs that don't have a slot for a network interface card.

DaynaPORT E/Z *$269*
Dayna Transceiver *75*

SYSTEMS

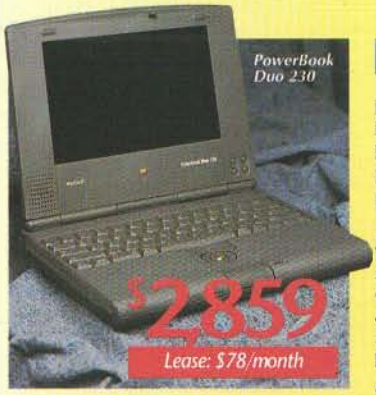
Quadra 800/Trinitron Intermediate Graphics Solution. *Quadra 800 with 8 MB of RAM, 230 MB hard drive, RealTech 20" Trinitron monitor with RasterOps PaintBoard Li, and KeyTronic MacPro Plus extended keyboard.*

LC III, 4 MB of RAM, 80 MB hard drive, RealTech 15" Full Page Display, and Apple standard keyboard... *$1799*

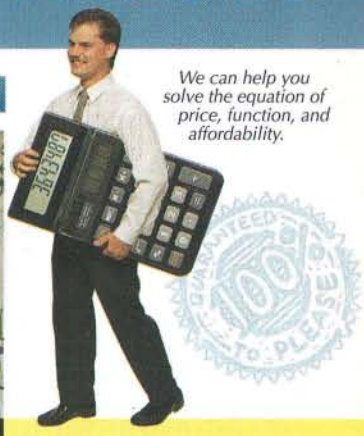
Centris 610, 4 MB of RAM, 80 MB hard drive, Mitsubishi 14" Diamond Scan monitor, and KeyTronic MacPro Plus extended keyboard *$2355*

Centris 650, 8 MB of RAM, 230 MB hard drive, RealTech 20" color monitor, RasterOps Paintboard Li, w/built-in Ethernet and FPU, and KeyTronic MacPro Plus extended keyboard *$6229*

Quadra 950, 8 MB of RAM, 560 MB Micropolis hard drive, RasterOps 20" Trinitron, and KeyTronic MacPro Plus extended keyboard *$8049*



PowerBook Duo 230, 8 MB of RAM, 80 MB hard drive, 33 MHz 68030 microprocessor *$2699*



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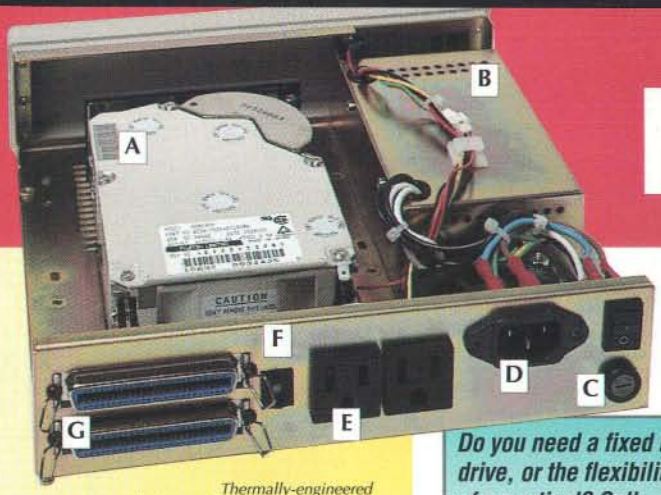

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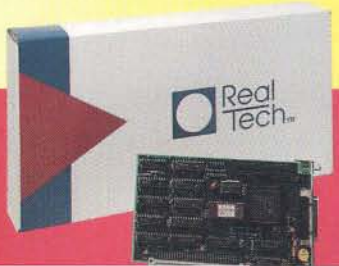

Do you need a fixed hard drive, or the flexibility of an optical? Call us; we can explain your options.	Model number	Internal price	External price	Formatted Mac capacity (in MB)	Average access time (in ms)	Transfer rate* (in MB/second)	Form factor**	Warrant (ye
85 - 120 MB								
Conner 85	CP-30080E	$209	$279	82	17	1.5	LP	1
Quantum 85	ELS85	199	269	82	17	1.4	LP	2
Conner 120	CP-30100	259	329	116	17	1.5	LP	1
Maxtor 120	7120	209	279	121	15	1.5	LP	2
127 - 245 MB								
Quantum 127	ELS127	$229	$299	124	17	1.4	LP	2
Conner 170	CP-30170E	259	329	160	9	1.5	LP	1
Quantum 170	ELS170	259	329	160	17	1.4	LP	2
Conner 212	CP-30200	359	429	206	12	2.5[1]	LP	1
Maxtor 213	7213	299	369	207	15	2.8[1]	LP	2
Quantum 240	LPS240	339	409	234	10	1.4	LP	2
Maxtor 245	7245	329	399	245.6	15	3.0[1]	LP	2
340 - 560 MB								
Maxtor 340	LXT-340	$599	$669	324	15	2.1[1]	HH	2
Fujitsu 520	M2624FA	799	869	496	9	2.7[1]	HH	5
Quantum 525	LPS525	899	969	525	10	2.9[1]	LP	2
Maxtor 540	MXT-540	919	989	546	9	5.5[2]	HH	2
Conner 540	CP-3540	899	969	515	12	5.5[2]	HH	1
Micropolis 560	M2105	1049	1119	532	10	5.0[2]	HH	5
700 MB - 1.3 GB								
Quantum 700	PRO700	$1199	$1269	670	10	2.9[1]	HH	2
Micropolis 800	M2108	1199	1269	698	10	5.0[2]	HH	5
Toshiba 877	MK-438FB	1099	1169	830	12.5	3.0[1]	HH	2
Quantum 1050	PRO1050	1239	1309	1000	10	2.9[1]	HH	2
HP 1050	97558	1649	1749	987	13.5	2.8[1]	FH	5
Fujitsu 1.2	M2266	1249	1349	1079	14.5	3.0[1]	FH	5
HP 1.2	C2247	1589	1659	1000	10.5	5.3[1]	HH	5
Micropolis 1.2	M2112	1249	1319	1005	10	5.0[2]	HH	5
Quantum 1.2	PRO1225	1419	1489	1200	10	2.9[1]	HH	2
Toshiba 1.2	MK-538FB	1399	1469	1200	12.5	4.0[1]	HH	3
Maxtor 1.2	MXT-1240	1399	1469	1240	9	4.0[2]	HH	3
Conner 1.3	CP-31370	2059	2129	1030	10.5	6.0[1]	HH	1
2.0 - 3.6 GB								
Fujitsu 2.0	M2652	2199	2299	1752	11	4.8[2]	FH	5
Seagate 2.1	ST42100N	1699	1799	1900	12.9	3.9[2]	FH	5
Fujitsu 2.4	M2654	2399	2499	2000	11	4.8[2]	FH	5
Micropolis 2.4	M1924	2599	2699	2100	10	4.8[2]	FH	5
Seagate 2.4	ST42400N	2549	2649	2050	10	4.5[2]	FH	5
HP 2.4	C3010	2899	2999	2000	11.5	5.3[2]	FH	5
Seagate 3.4	ST43400N	3399	3499	2750	11	6.0[2]	FH	5
Micropolis 3.6	M1936	3299	3399	3022	10	6.0[2]	FH	5

* Transfer rate (or throughput) depends on your Mac CPU and system configuration. For more information, ask your Hardware That Fits sales partner. ***Form Factor Low Profile (LP)=3.5 Half Height (HH)=3.5 Full Height (FH)=5.*

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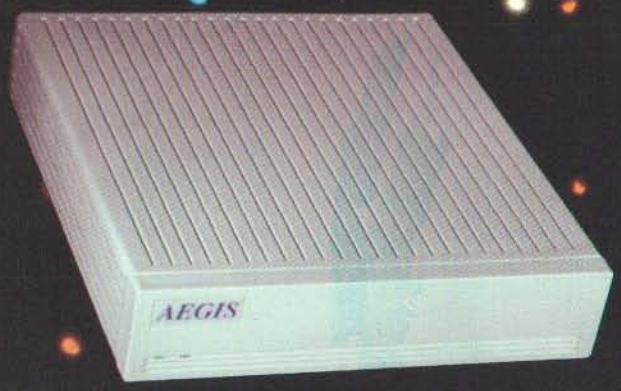

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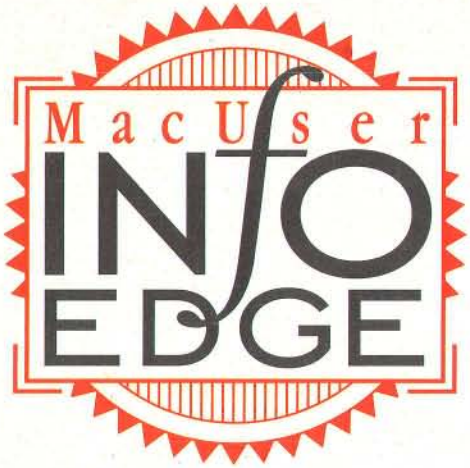

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281-301

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A forum for innovative, unique, low-cost and hard-to-find Macintosh hardware, software, and miscellaneous products and services.

302-303

Product Categories

	Premier	Classified	BusinessCard
Hardware			
Accelerator Boards	277	281	302
Bar Coding		281	
CD-ROM			302
Communications			
Computer Systems		281	
Data Acquisition			
Disk Drives	277	288	
Diskettes		288	
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Input Devices	277		
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Networking			
Peripherals	277	294	
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Printers			
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Tape Drives			
Used Equipment			
Software			
Accounting			302
Back Up Systems			
Bar Coding	278	296	
Business	278		302
Business Time Management			
CAD/CAM			
CD-ROM		298	
Communications/Networking		296	302
Desktop Publishing			
Educational			302
Emulation			
Engineering		296	
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Financial			
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Genealogy			
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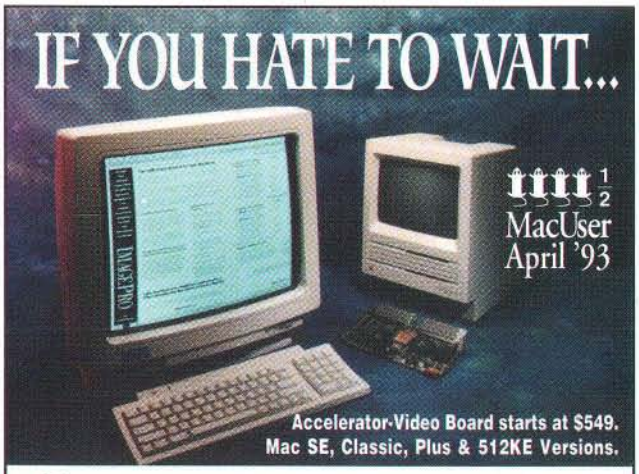

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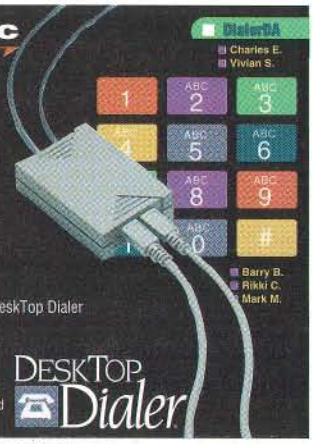

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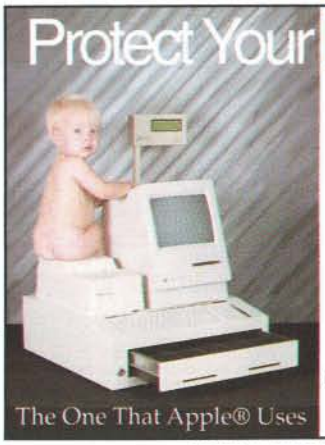

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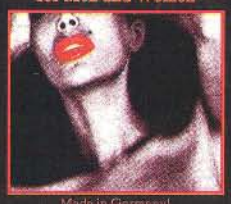

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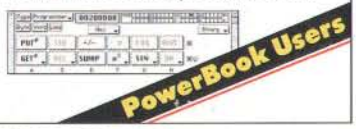

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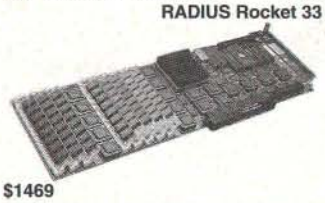

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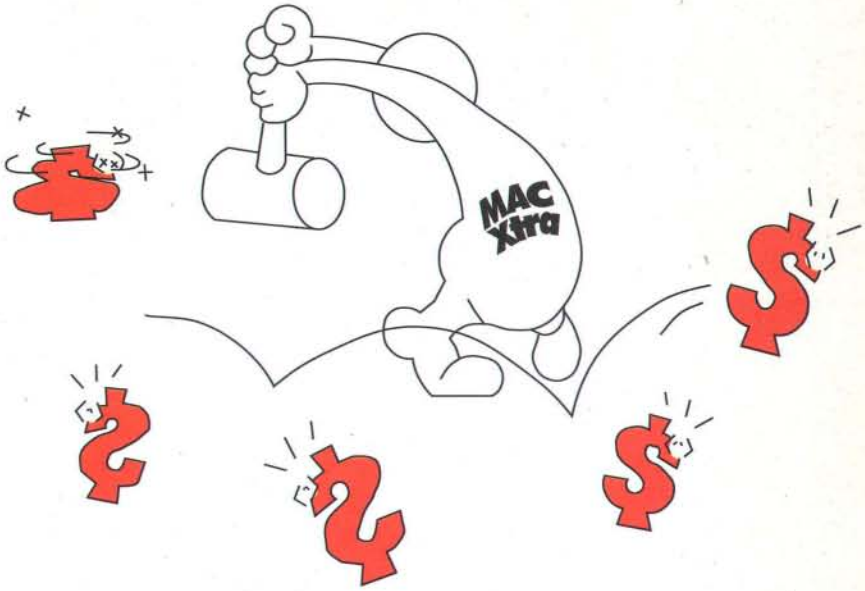

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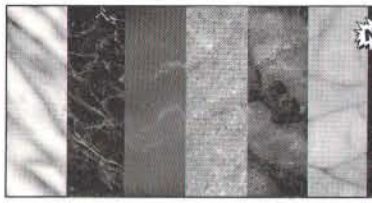

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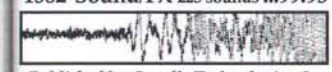

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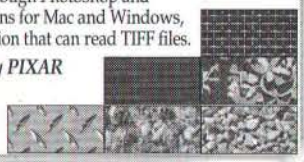

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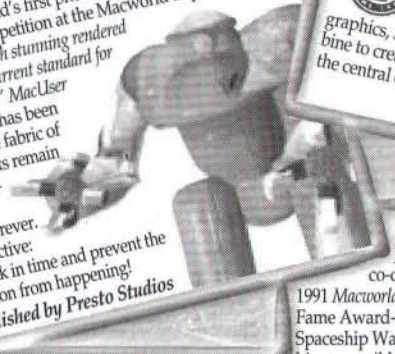

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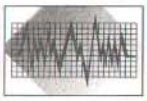

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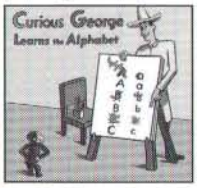

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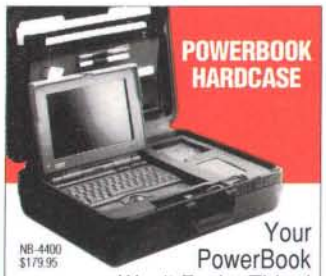

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Welcome to AppleLand

An Apple amusement park? Stranger things have come from Cupertino.

Apple Computer. I'm forever amazed at how a company with such a shallow line of products can make so much money. I believe a large part of its success can be attributed to the carnival-like atmosphere that surrounds the company itself. Wouldn't it be interesting if Apple faced reality and opened an amusement park that could showcase its true talents?

AppleLand, like any great amusement park, would be self-promoting. All the rides would be related to the Macintosh or to the history of the company. Here are some of what I think would be the most popular rides:

First would come the Trip through History ride. You climb into a giant Mac Classic on tracks and look through the screen as you embark on a fantasy tour of the history of computers. There's the ENIAC, with a bunch of Disney-style animatrons feverishly changing vacuum tubes. You ride past a young Tom Watson as he takes a baseball bat to some guy who didn't pay him. All the charming early history of computers is there.

The rides relating directly to Apple would be all over AppleLand. Expect long lines for the Wonders of Woz ride, where you start out in a garage watching an animatronic Steve Wozniak munch on potato chips while soldering wires on his first Apple I. The young, bearded Steve Jobs comes in and gawks at what Woz has invented. His mouth moves: "Gee, I think we might be able to sell these." Woz's head slowly turns: "You really think so?" The Jobs robot nods as the ride moves to the next scene showing more success. Then to the airport, where Woz climbs into an airplane cockpit. "Gee, these things can't be hard to fly. After all, I invented a computer!" Bam! A spectacular crash. On to the next scene, Woz taking courses in Berkeley and saying he wants to be a teacher at $4.50 an hour. Nothing like a conk on the head to change your perspective.

There would be a ride devoted to Steve Jobs too, although the lines would be shorter. It starts with a scene in India, where Jobs is seated in the lotus position in a small audience listening to some guru spew non sequiturs. Scene after scene of Jobs' formative years are revealed until we reach his heyday. We go inside his office and find him screeching at a secretary, "You're an idiot!" Then screeching at a programmer, "This is crap!" Then screeching at a journalist, "You're an idiot!" Then screeching at a supplier, "This is crap!" The final scene shows Jobs pounding his fist on the desk of the newcomer John Sculley. "I quit!" screams Jobs. Sculley's mouth drops open: "B-b-but, Steve!" Apple kindly leaves out the part where it is going to sue Jobs for taking a couple of key employees to NeXT.

The Sculley ride would come next, with almost no wait in line at all. This journey starts with John marrying the boss's daughter at Pepsi. A big celebration scene follows as the father-in-law congratulates Sculley on his promotion with a wink. Another scene shows him on the phone with Steve Jobs. Sculley's heard to say, "How about stock options?" Then he nods. Scene after scene shows Sculley in the lab or working closely with the designers. He nods a lot. The final scene shows him at home, jumping on a trampoline, trying to juggle one apple while photographers from *People* magazine take pictures of him.

Added Attractions

The AppleLand park would also feature lots of nouveau amusements based on virtual-reality technologies. Again, the themes would be self-promotional and Apple-related. By the time the park is built, psychological thrill rides will be in vogue. "Go into Wozniak's brain . . . invent a computer!" "Become Steve Jobs as he berates a secretary . . . see how enjoyable it is!" "Design a Newton . . . see how it feels when nobody cares." "Negotiate a deal with IBM . . . see how Microsoft somehow benefits!" On and on.

Of course, there would be standard rides too. A unique roller coaster based on the up and down curves of Apple's volatile stock price would be right at the front door of the park. It would, of course, be named the Big Dipper.

It would be a popular place, for sure. The admission would be a little more than that of Disneyland and twice that of any of those Disney-clone parks. The visitors would be pretty much the same people over and over. Eventually, most of the rides would be copied by Windowsland, built on the old site of the Seattle World's Fair. The Steve Jobs ride would be recast as the Bill Gates ride and would have a more boring beginning and a happier ending. Admission would always be half-price in Seattle, and many of the rides would continually break down. It would still be a cheap place to visit.

ILLUSTRATION: ROBERT ZIMMERMAN

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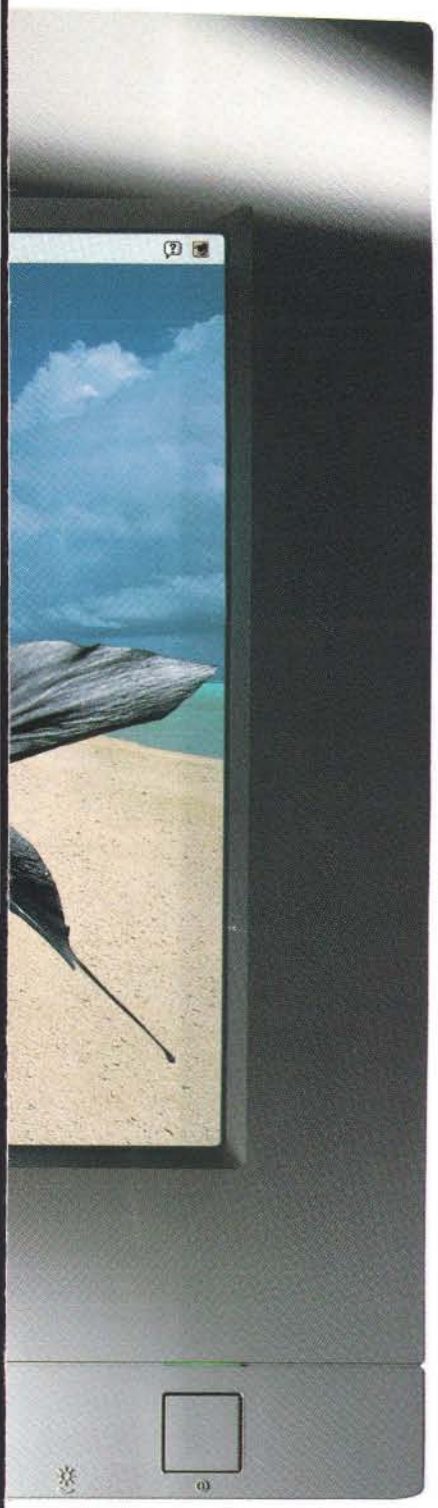

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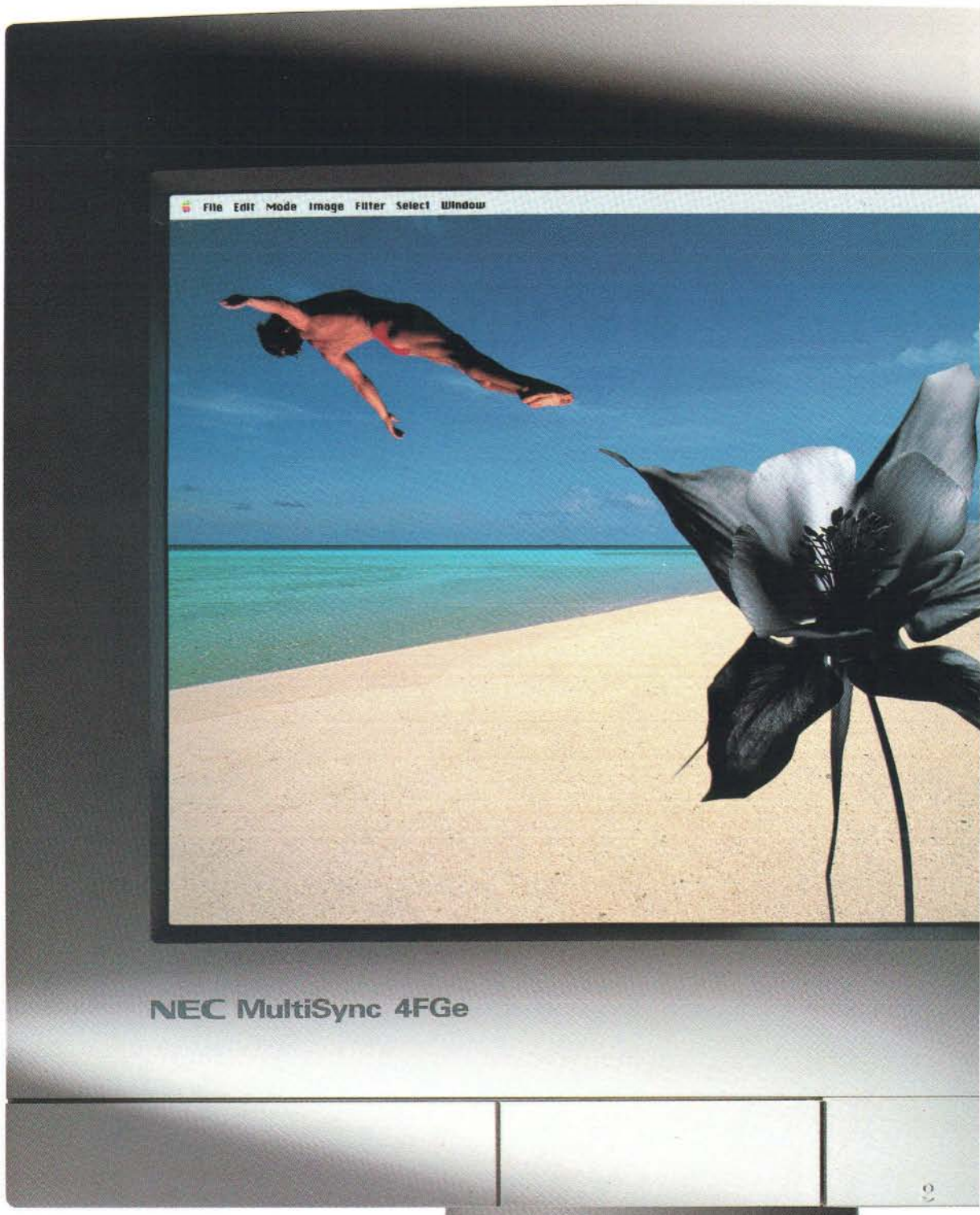

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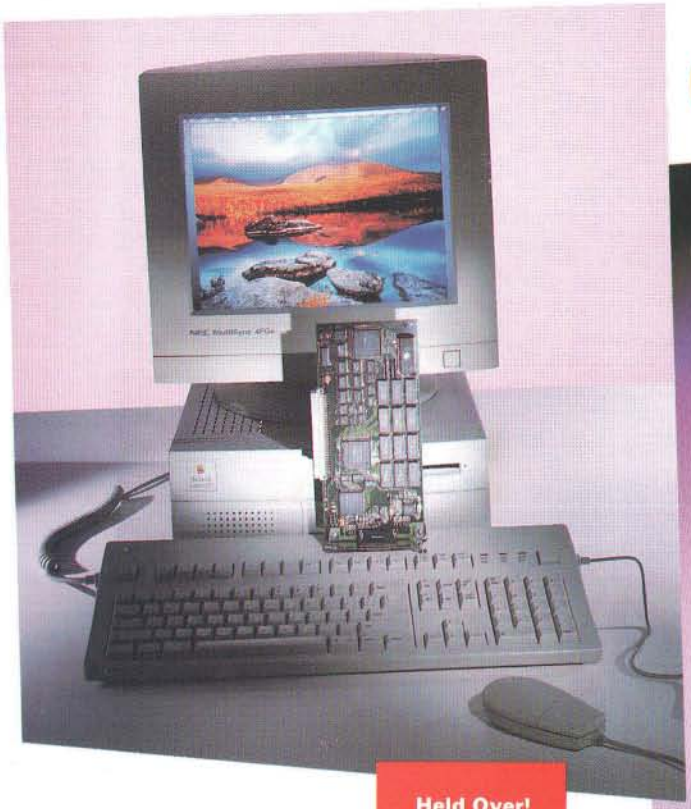

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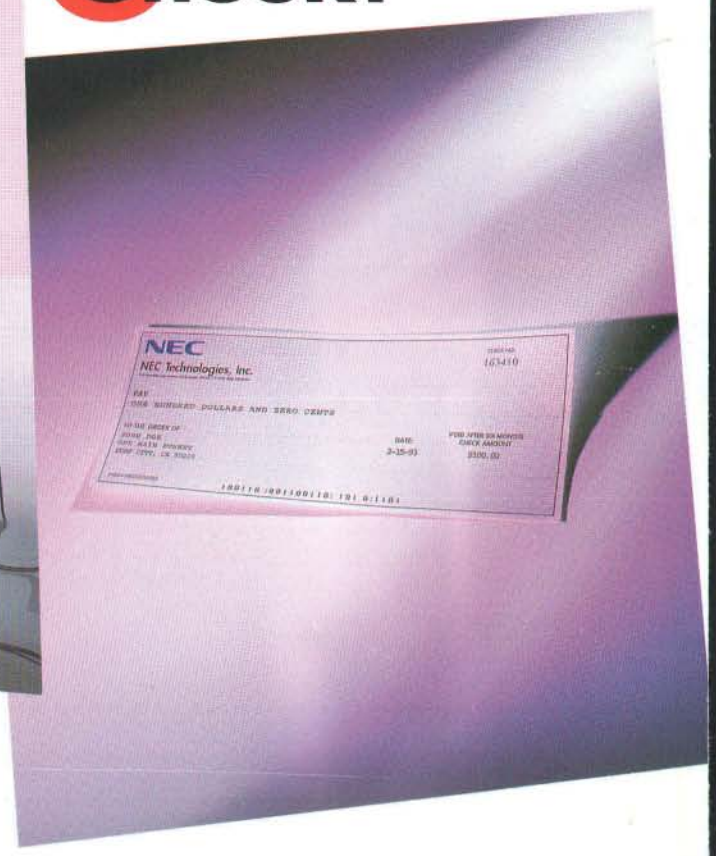

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